FLIGHT

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Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

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Flight.

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EDITORIAL COMMENT.

The Naval Estimates.

According to certain of the best informed of the dailies, the Government is even now considering the Naval Estimates for next year. If this be so, it is doubtless in direct consequence of the vastly expanded programmes of certain of the Continental Powers. That the Government considers the position to be a serious one is obvious from the nature of Mr. Churchill's latest pronouncements on naval defence, and, as his tentative offer to Germany appears to have fallen on deaf ears, it is equally obvious that the Estimates for 1914-15 will show a substantial increase over those of past years. It is sufficiently disquieting for the thinking citizen of the Empire to watch these already huge sums which are expended on armaments growing by leaps and bounds as the years pass, but it must equally be admitted that there is no help for it, if we are indeed to maintain our status as a world-Power. We frankly do not envy the task of the First Lord, who has to fit in on the one hand with what he and his professional advisers know to be necessary for our national safety and to reckon, on the other, with a Treasury which, to put it mildly, is not over and above generous in matters which do not happen to appeal to its head for the time being. The danger is that the financial exigencies are apt to manifest a reflex action on details which are essential but which are imperfectly understood of the man in the street. After all, it is the latter, in the shape of public opinion, who counts most in these matters, for if only there be a sufficient volume of opinion behind things they have a habit of getting done. That is why we would appeal to those on the inside of things aeronautic to by no means lose sight of the fact that we must progress in this branch of defence equally with others. We sincerely believe that Mr. Churchill and his advisers recognise the true importance of aerial defence, and are fully content to believe that they will do—and have already done—all that is possible with the means at their disposal to place that branch of the Service on a satisfactory footing. But their hands would be vastly strengthened by a strong volume of public opinion which insisted on a really strong aerial navy. Much has been done by the Press of the country to secure that necessary volume of opinion, but much more remains to be done, and we trust that this fact will not be lost to sight between now and the time the next Naval and Military Estimates come to be submitted to Parliament.

Germany and her Air Fleet.

There is one thing that stands out most prominently as a result of the latest disaster to one of Germany's fleet of Zeppelin airships, and that is the iron-hard determination to allow nothing in the way of disaster or loss of life to impede or delay the development of a service which she has determined shall be unchallengeable by any rival. It is the true martial spirit that Germany is displaying in the face of set-backs and disappointments—that spirit of grim determination which we once prided ourselves was the inherent characteristic of our own people, and, let us say, is still one of the most splendid qualities of our race.

Such a disaster as that which overtook the L2, following so close upon the heels of the previous calamity, is one that might appal a weak people to the point of compelling acknowledgment of defeat and an utter abandonment of the enterprise toward. But so far from any such effect having been produced on the German nation, we find that it has simply steeled them to even greater efforts. No finer answer to the disaster could be conceived than that given by the order for an immediate ascent of another craft with instructions to cruise over

Berlin, as a living object-lesson of Germany's determination to see the thing through, no matter what the cost. She has determined that the perfect airship can be developed, and having set herself to the task, there can be no turning back, no matter what the price of success may be. We have become accustomed to regard Germany as a potential, nay, a probable foe, but even where she our active enemy, we could not at a moment like this withhold our admiration of her behaviour in the face of appalling disaster

And what of ourselves? Are we to argue that because disaster after disaster has overtaken Germany's pet type of airship that there is nothing to be hoped from the dirigible, and to sit down and allow others to do our experimenting for us? The answer lies with the future, but we cannot find it in our hearts to believe that we shall do aught but continue along the path of investigation and progress. In this connection we publish on another page a most interesting letter from Sir Hiram Maxim, in which he expresses the deliberate conviction that we have gone as far as possible with the design of the dirigible, and that nothing more is to be hoped from it. We do not propose to traverse his statements in detail, particularly as he quotes chapter and verse in support of his theories, but we must say at once that we do not for a single moment agree with his main contention. Indeed, we should describe his conclusions as dangerous in the extreme at the present juncture. He speaks as an authority, whose words are very likely to find ready acceptance in many quarters where they may do incalculable damage to the cause of aeronautic progress. We must certainly say that we admire the German attitude of determination to succeed far more than we do Sir Hiram's theoretical damnation of the dirigible.

Germany, in the face of disaster, says calmly and emphatically: "We will go on building." Sir Hiram, apparently, would have us sit with folded hands, because, forsooth, progress infers danger!

Reflections on Recent Performances.

It is impossible to read of some of the more notable performances in the air which have been recorded of late without reflecting how absolutely commonplace flying has now become. Not long ago, a flight of a mile was enough to have ensured columns of high-flown descriptive reports in all the newspapers of the civilised world. Now, a flight of a thousand miles passes with the simple record contained in an obscure paragraph, or nothing. The manner in which these things pass almost unnoticed is, to our way of thinking, one of the most wonderful aspects of the later development of flight. It simply amounts to the seeming paradox that the most wonderful thing about man-flight is that it has ceased to have anything wonderful about it.

Take, for example, the performance of Fourny, on a Maurice Farman biplane about a month ago, when he succeeded in flying an average of 425 miles a day for twenty-three consecutive days in the competition for the International Michelin prize. Or take Seguin's flight from Paris to Bordeaux and back, a *non-stop flight* across country of 13 hrs. 5 mins., during which the Henry Farman biplane traversed a distance of 650 miles. Or again, take the extraordinary records in the competition for the prize offered in Germany for the longest flight in twenty-four hours on an all-German machine. As mentioned in our last issue, the best performance to date is that of Stoeffler, who, on an Aviatik biplane, covered over 1,300 miles in twenty-four hours, of which period he was actually in the air for over twenty-two hours, a good deal of which was in the night.

There have been other flights made recently which are almost equal in merit to these, but they will serve amply to point the moral we have in mind and which we have outlined above. It seems almost useless nowadays to talk about progress, for the one and simple reason that so much progress has been made in the science and practice of aviation that no one any longer pays any attention to it.

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NORMAN C. SPRATT,

PILOT-INSTRUCTOR.

NORMAN C. SPRATT is a pilot who has been given to us by South Africa, he having been born at Pietermaritzburg, although, as he is careful to tell you, of Irish parents. Before he was bitten with the aviation fever he was an assistant engineer in the Ladysmith District of the Public Works Department, South Africa, a post which he vacated in the summer of 1912 in order to come home to England to learn the art of piloting aeroplanes.

He joined the Deperdussin School at Hendon in August, 1912, and in October was in possession of his *brevet*—No. 339. The following February he returned to the Deperdussin monoplane school as chief pilot-instructor, and remained there until the closing down of the school early in August last. While there he showed his aptitude as a pilot by the way he handled the 35 h.p., 60 h.p., and 110 h.p. monoplanes. He also flew the experimental hydro-aeroplane "The Seagull," when it was fitted with a chassis for land work, on one occasion making a quarter of an hour's flight at a height of 800 feet. On one occasion he took up a 35 h.p. Dep. to 3,500 ft., and then had to come down on account of engine trouble. On another occasion he climbed on a 35 h.p. Dep. to a good height in a wind which kept Chevillard on his 80 h.p. Henry Farman from reaching much over 1,000 ft.

In September he joined the Breguet firm, and after a short spell of flying the machines in France, returned to Hendon, and has been flying Breguets almost daily since. A week or so back, in a wind blowing at a speed of between 40 and 50 miles an hour, he was flying one fitted with a 7-cyl. Canton-Unne motor.

THE HAWK.

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British Military Aviation.

ONE of the first pieces of work of the new air department at the War Office has been to prepare a set of notes for the guidance of flying officers and officers in charge of men whose manœuvres are being observed from hostile aircraft. The notes have been drawn up as the result of the experience gained by various officers who have carried out a great deal of scouting and reconnaissance work, while the manœuvres recently held also provided a great amount of useful information. Aircraft are to keep, as a rule, at not less than 3,000 ft. when exposed to rifle fire, increased by another 1,000 ft. when artillery is underneath. In the General Staff Notes is set forth very clearly the importance of such things as seeing that every advantage is taken of cover; that the colour of the ground is not in direct contrast to the troops on it; that the men do not directly look up at the aircraft; keeping close to the hedge when marching along a road, &c., &c.

MEN OF MOMENT IN THE WORLD OF FLIGHT.

Pilot-Instructor.

MR. NORMAN SPRATT.

A view of the surf at Watsonville, California, as seen from a biplane.

OUR FULL PAGE PORTRAITS.

IN response to many requests, we publish below a list in alphabetical order for each year, with the dates of appearance, of the full-page portraits which have appeared in FLIGHT of Pioneers, Pilot-Constructors, Pilots, &c.

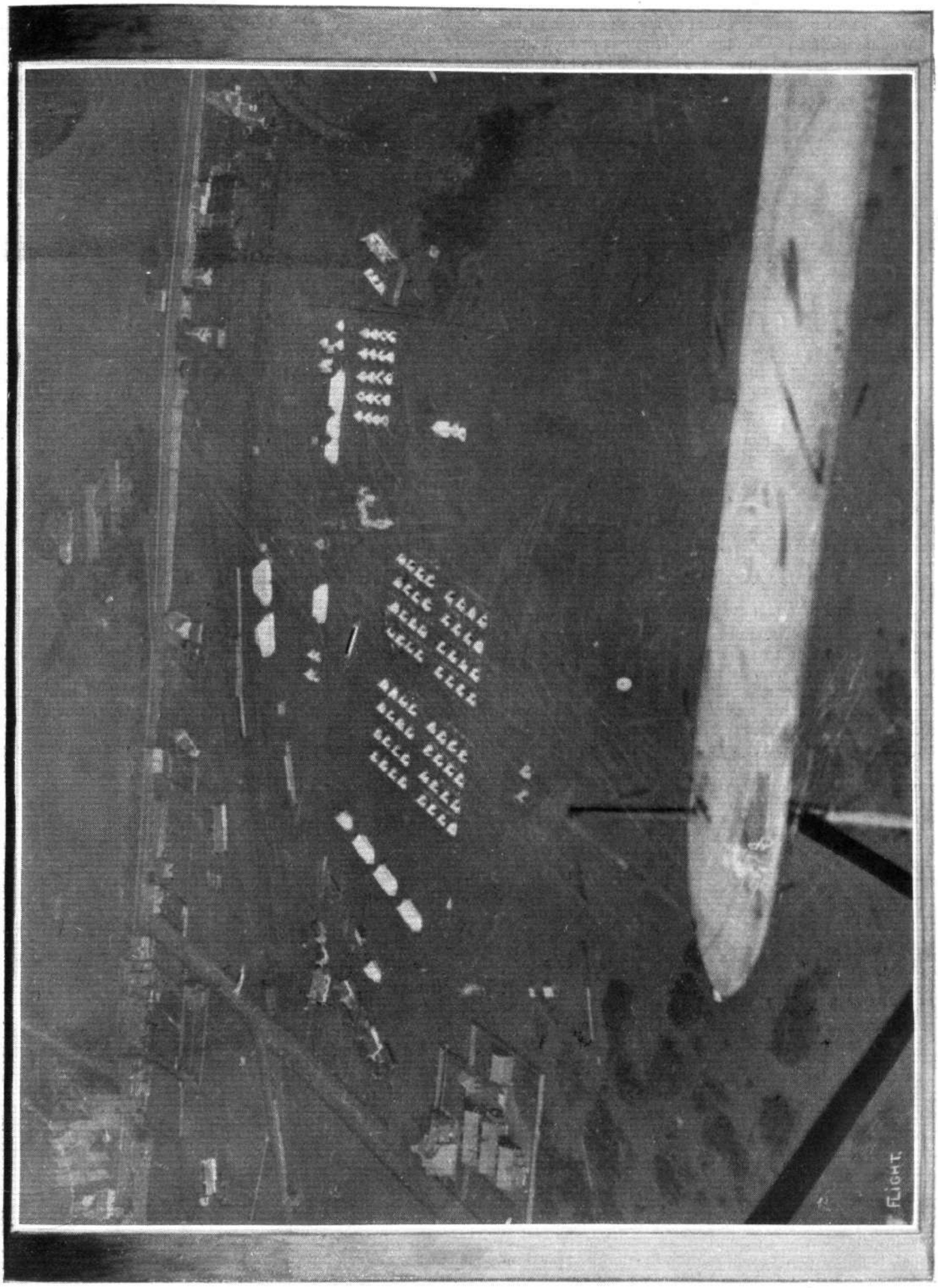
Nearly all these copies are still obtainable from the Publishers, 44, St. Martin's Lane, London, W.C., at 6½*d.* each, post free, for those published during 1909, 1910, 1911 and 1912. For the current year (1913) the charge is 3½*d.*, post free. These portraits form a unique collection of prominent men in the World of Flight.

FLIGHT PIONEERS.

Name.	Date Published.
	1909.
CODY, S. F.	Sept. 18
MCCLEAN, Frank	Dec. 18
MOORE BRABAZON, J. T. C.	Nov. 6
ROLLS, Hon. C. S.	Nov. 13
	1910.
BARNES, G. A.	Sept. 24
BOYLE, Hon. Alan	July 23
CLEMENT, A.	Oct. 22
COLMORE, G. C.	Dec. 10
DICKSON, Capt. Bertram	July 16
DREXEL, J. Armstrong	July 30
DUNNE, J. W.	Sept. 3
FARMAN, Henry	Feb. 12
GIBBS, Lancelot D.	Aug. 13
GILMOUR, D. Graham	Oct. 29
GRACE, Cecil	July 9
GRAHAME-WHITE, C.	April 30
LADOUGNE, Emile	Oct. 15
LORAINE, Robert	Sept. 17
MCARDLE, W. E.	Nov. 26
MAXIM, Sir Hiram S.	Mar. 12
MOISANT, John B.	Aug. 27
OGILVIE, Alec	Sept. 10
PAULHAN, Louis	Jan. 22
RADLEY, James	Aug. 20
ROE, A. V.	Jan. 29
SINGER, Mortimer	Jan. 15
SOPWITH, T. O. M.	Dec. 3
	1911.
ASTLEY, H. J. D.	Mar. 25
BARRINGTON-KENNETT, Lt. B. H.	Sept. 16
BLONDEAU, G.	Sept. 23
CONNEAU, Lieut. ("Beaumont")	July 15
CONNER, Lieut. D. G.	Mar. 4
DUCROCQ, Maurice	April 29
FULTON, Capt. J. D. B., R.F.A.	Dec. 23
GRESWELL, C. H.	Feb. 25
HAMEL, Gustav	April 1
HEWLETT, Mrs. Maurice	Aug. 26
MOORHOUSE, W. B. R.	Oct. 14
MORISON, O. C.	Jan. 21
PIXTON, C. H.	May 6
PORTE, Lieut. J. C., R.N.	Dec. 9
PRIER, Pierre	April 22
SAMSON, Lieut. C. R., R.N.	Oct. 7
SANTONI, D. Lawrence	Dec. 9
STOCKS, Mrs. C. de Beauvoir	Nov. 18
VALENTINE, James	June 24
WATKINS, Lieut. H. E.	Feb. 4
WEYMANN, C. T.	July 8
WOOD, Capt. H. F.	Feb. 18
	1912.
HERVEU, Mdme. Jane	Jan. 6
HEWITT, Vivian	May 4
LONGMORE, Lieut. A. M., R.N.	April 20
SALMET, Henri	Mar. 16

MEN OF MOMENT IN THE WORLD OF FLIGHT.

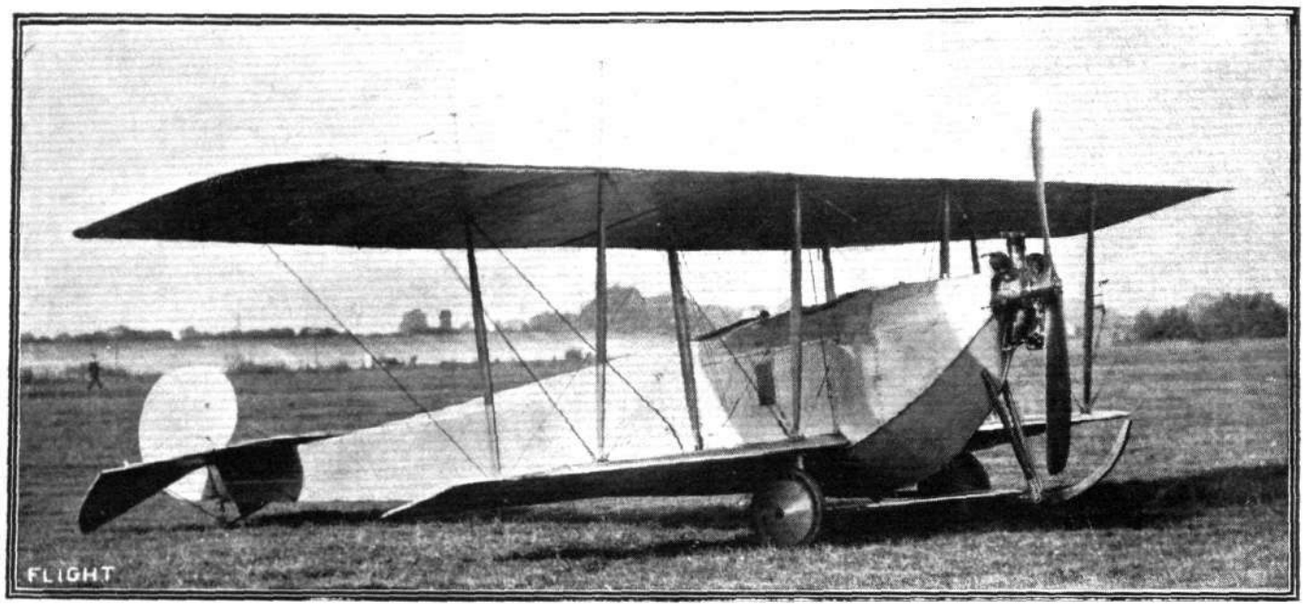
	1911.
NORTHCLIFFE, Lord	Aug. 5
	1912.
ARBUTHNOT, Maj.-Gen. H. T., C.B.	Nov. 23
GLAZEBROOK, Dr. R. T., C.B.	Nov. 16
HENDERSON, Brig.-Gen. D. C. B.	Nov. 9
HOLDEN, Col. H. C. L., C.B.	Nov. 2
NORTHCLIFFE, Lord	Nov. 30
O'GORMAN, Mervyn, C.B.	Dec. 28
PAINE, Capt. G. M., M.V.O., R.N.	Dec. 14
ROSE, the late Sir Charles D.	Oct. 19
RUCK, Maj.-Gen. R. M., C.B., R.E.	Oct. 26
SYKES, Maj. F. H.	Dec. 21
WHITE, Sir George, Bart., LL.D	Dec. 7
	1913.
BLACKBURN, R.	May 17
BLONDEAU, Gustave	June 7
COANDA, M.	May 24
CODY, S. F.	Feb. 1
DUNNE, J. W.	Feb. 15
DYOTT, G. M.	June 14
ENGLAND, E. C. Gordon	April 19
EWEN, W. H.	May 10
FLANDERS, L. Howard	Mar. 29
GRAHAME-WHITE, Claude	Jan. 18
HAMEL, Gustav	June 21
HAVILLAND, G. de	Feb. 22
HAWKER, H. G.	July 12
HEWLETT, Mrs. Hilda B.	June 7
HUCKS, B. C.	June 28
KOOLHOVEN, S. F. W.	May 31
LANCHESTER, F. W., M.I.C.E.	Jan. 4
MCCLEAN, Frank K.	Mar. 15
MANNING, W. O.	Mar. 22
MERRIAM, F. Warren	July 19
PAGE, F. Handley	Mar. 1
PATERSON, Compton C.	Aug. 23
PERRIN, Harold E.	Jan. 11
PICKLES, Sydney	Aug. 2
PIXTON, C. Howard	July 5
PIZEY, Collyns P.	July 26
PORTE, Lieut. J. C.	May 3
RADLEY, J.	April 12
ROE, A. V.	Jan. 25
SANTONI, D. Lawrence	April 26
SIPPE, Sidney V.	Aug. 30
SLACK, Robert B.	Aug. 16
SOPWITH, T. O. M.	Feb. 8
THOMAS, G. Holt	Mar. 8
TURNER, Lewis W. F.	Aug. 9
WRIGHT, Howard T.	April 5



The camp of the 3rd Gordons at Montrose, taken from a Maurice Farman machine.

THE FLANDERS BIPLANE.

AFTER a number of delays, due to no inherent fault in the machine itself, the Flanders biplane has proved that it possesses all the good qualities looked for in a machine, which is the product of so able a designer as Mr. L. Howard Flanders, whose name has in the past been more generally associated with the construction of monoplanes. Unfortunately Mr. Flanders cannot be present to witness the excellent flying now done by the machine of his creation, as he has been ordered by his doctor to go for a six months' trip to Australia, in order to recuperate after his recent motor smash. We feel certain that all our readers will join us in wishing Mr. Flanders a speedy recovery.



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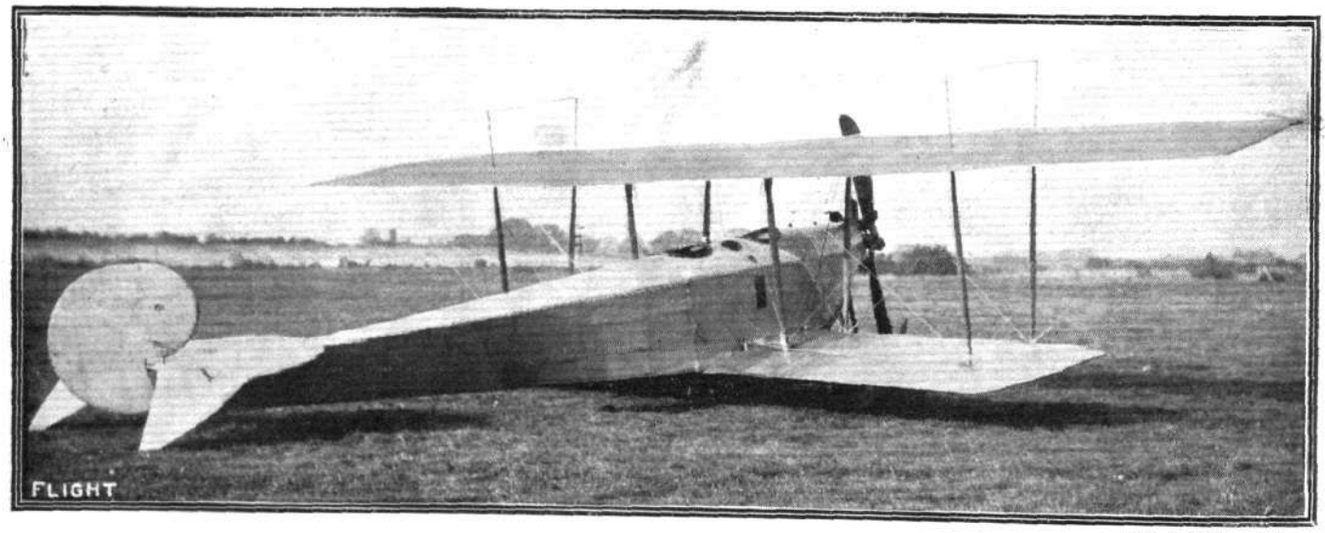
THE ISAACSON ENGINED FLANDERS BIPLANE.—Three-quarter view from the front.

As for the machine itself, one of the first characteristics noticed is the extremely deep *fuselage*. On closer inspection the shape of that member is rather unusual, being of pentagonal section in the front portion and tapering away to a triangular cross section at the rear. The lower *longeron* or keel of the *fuselage* runs right through from bow to stern, as do also the two upper *longerons*. The lower *longerons* starting from the nose of the machine curve down abruptly to form the sides of the rectangular portion of the *fuselage*, and form a spliced joint with the keel about six feet to the rear of the pilot's seat. The *longerons* are of hickory in the front portion where the weight is concentrated, and where consequently the greatest strength is required, whilst in the rear the *longerons* are made of ash. The struts and cross members are of ash in front and of spruce behind, the whole being made rigid in the usual way by diagonal cross wiring. A turtle back formed by longitudinal stringers, and having its highest point in the neighbourhood of the pilot's seat, from where it gradually flattens out towards the tail plane, gives a neat appearance to the top of the *fuselage* as well as affording protection against the flow of air, as only the pilot's and passenger's heads project above the turtle back.



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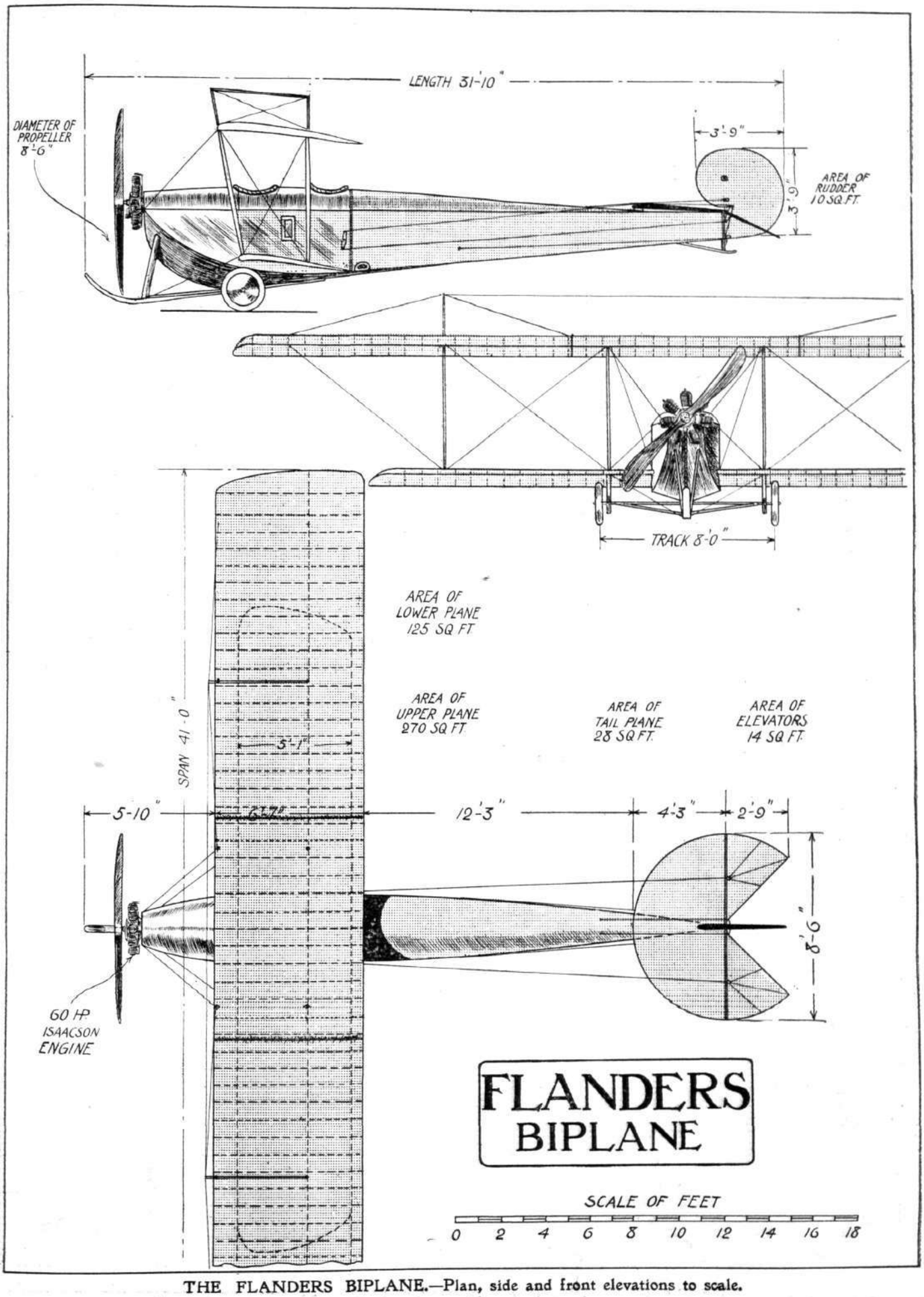
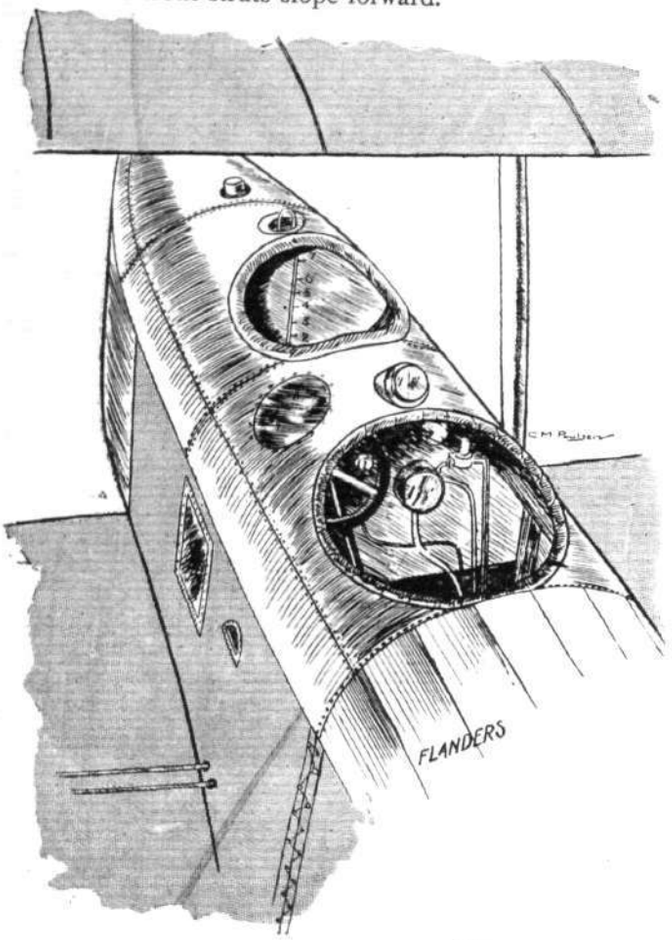
THE ISAACSON ENGINED FLANDERS BIPLANE.—Three-quarter view from behind.

Another point which characterises this interesting



THE FLANDERS BIPLANE.—Plan, side and front elevations to scale.

machine is the peculiar arrangement of the main planes, the upper one of which is of considerably greater chord than the lower one, and being furthermore staggered forward. It will be noticed that this is obtained by having the rear struts at right angles to the line of flight whilst the front struts slope forward.



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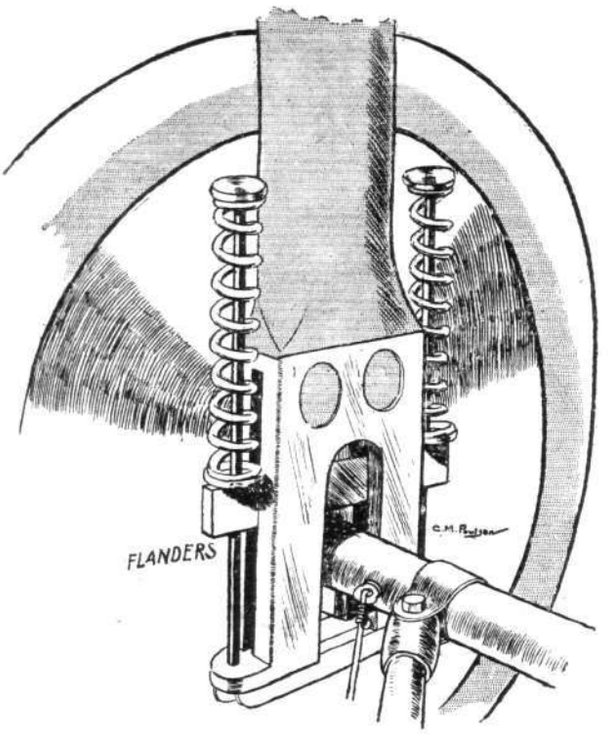
View from above of the pilot's and passenger's seats in the Flanders biplane.

From the front elevation of the machine it will be seen that there is a considerable overhang to the upper plane, the weight of which, when the machine is on the ground, is taken by top bracing wires carried over king posts. Both top and bottom planes are straight, *i.e.* there is no dihedral angle, but the angle of incidence diminishes towards the tips of the planes, thus forming a pronounced "wash out." With the exception of the two inner plane struts, which serve to support the chassis struts and therefore are made of ash, the plane struts are all made



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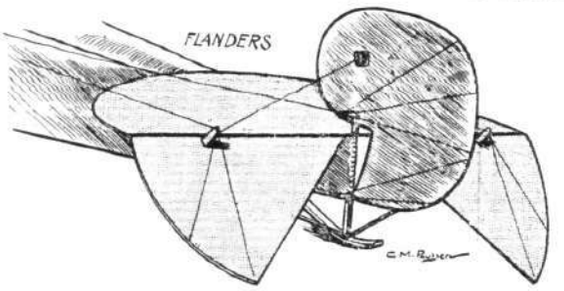
Method of springing the landing wheels.

of solid spruce. The wings are built up of spars of I section, ash being the material employed in the centre portion, while the outer part is made of spruce. The ribs have webs of white pine with flanges of ash, the whole being bound with fabric to prevent the wood from



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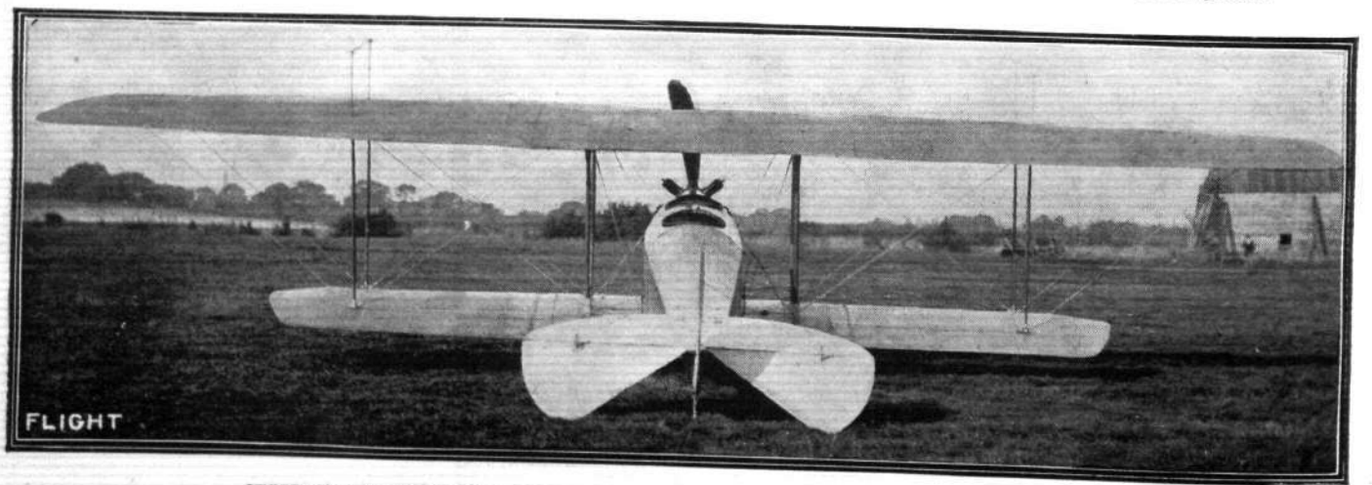
The tail planes on the Flanders biplane.

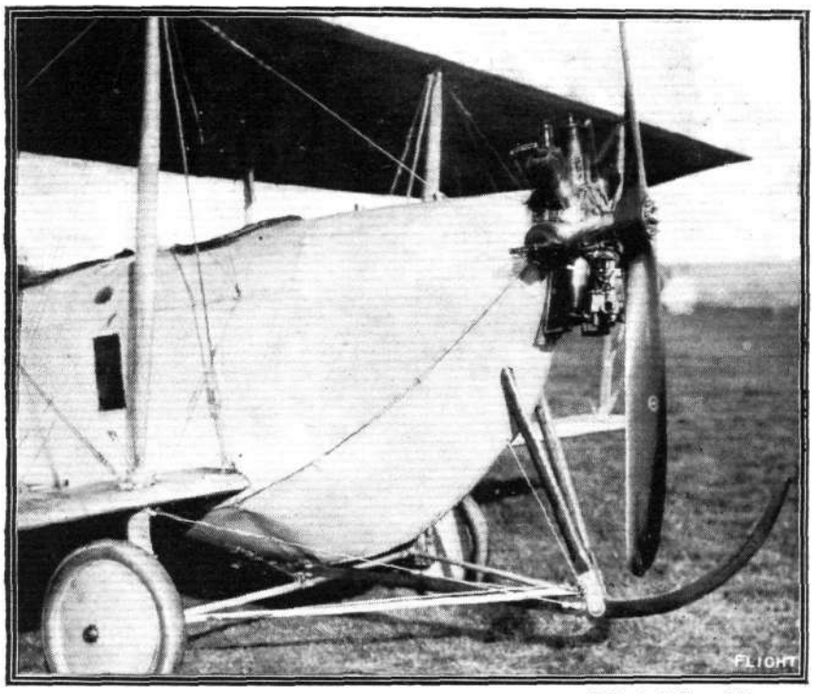


THE ISAACSON ENGINED FLANDERS BIPLANE.—View from behind. "Flight" Copyright.

splitting. In the present machine wing warping is employed for maintenance of lateral stability, but the next machine will be fitted with *ailerons*, which has the advantage of doing away with the constant twisting of the wing spars, which may in time cause fatigue.

A hickory skid secured to the keel of the *fuselage* and running parallel to it is supported in front by a pair of V struts sloping down from the upper *longerons* of the *fuselage*. Anchored to the keel are the two portions of the divided axle, which carries on its extreme ends the two landing wheels. The method of springing these is shown in one of the accompanying sketches, which is, we think, self-explanatory. It will be noticed that the whole landing chassis is extremely simple, and offers a minimum of head resistance, while at the same time it is quite efficient. Owing to the proximity of the lower plane to the ground there is a certain cushioning effect in landing which greatly facilitates that operation.

Mounted on the rear of the *fuselage* are the tail planes which are of the same type as those characteristic of the



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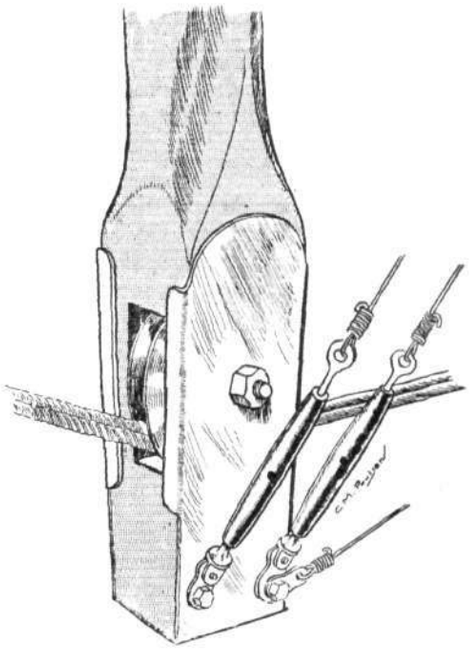
THE ISAACSON ENGINED FLANDERS BIPLANE.—View showing the chassis and engine mounting.

Flanders monoplane and consisting of a fixed tail plane of semi-circular shape to the trailing edge of which are hinged the elevator planes, and of a rudder composed of, roughly speaking, two semi-circular surfaces of which the upper and smaller one is in front of the pivoting point. Double stranded cables pass from the crank levers on the rudder and elevators to the control levers in front of the pilot's seat. A tail skid of very simple construction prevents the tail planes from coming in contact with the ground.

Inside the very deep *fuselage* are the pilot's and passenger's seats, arranged tandem fashion, the passenger occupying the front seat, from where he has an exceptionally fine view of the ground below, situated as he is well out in front of the lower plane. In front of him is a petrol service tank with a capacity of 7 gallons, or sufficient for a flight of an hour and a half. Under the passenger's seat is another tank with a capacity of 15 gallons, petrol being transferred from this to the service tank by means of a pressure pump. On a dash in front of the pilot are mounted the revolution indicator, oil pressure gauge, petrol pressure gauge, tell-tale oil glass, air-speed indicator, clock and compass, while on top of the *fuselage* is mounted an altimeter.

Secured to the nose of the *fuselage* is the overhung engine, a 60 h.p. Isaacson radial stationary motor, driving directly a Lang propeller of 8 ft. 6 ins. diameter, 5 ft. 6 ins. pitch. After having been overhauled at the Isaacson works at Leeds, this engine is now giving entire satisfaction, having apparently been cured of all the little troubles always experienced in a new engine, and judging from the way it takes the biplane off the ground after a very short run it develops at least all its rated horse power. Certainly, as fitted to the Flanders biplane, it is entirely satisfactory, and it is to be hoped that it will soon gain the popularity that it certainly deserves.

In the hands of Mr. A. Dukinfield Jones, the Flanders biplane is now flying extremely well, getting off in a



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Sketch showing method of carrying warping cables through one of the plane struts.

remarkably short space and climbing at a very steep angle, while her flying speed must be in the neighbourhood of 60 miles per hour. The weight of the machine empty is 1,000 lbs.

An interesting point in connection with the warping of the wings is the fact that the warping cable passes right through from wing to wing, a branch cable being joined to the main cable outside the *fuselage* and terminating in short lengths of chain which pass round sprockets on the control wheel, operating the warp, so that should these branch cables break, the main cable will still be carrying its load, and the pilot would have a chance of being able to glide down safely, although he would not, of course, be able to use his warp.

Duralumin has been used in the construction of the machine for radius rods, wing-spar clips, rudder and elevator crank levers, and most of the strut joints. The planes are covered with Hewittson's fabric and doped with Cellon.

FLYING AT HENDON.

THERE was an attendance of about 15,000 up at Hendon on Thursday of last week upon the occasion of the *Weekly Dispatch* Day. Although it was somewhat misty it was quite fine, and some very good flying was witnessed, whilst during the afternoon the "Beta" passed over the aerodrome. One of the features of the meeting was the ascent of some 15 ladies and gentlemen who were holders of the *Weekly Dispatch* free flight tickets. All were given flights on the various machines, and thoroughly enjoyed the experience. Many other passengers were also taken up, including Mrs. E. Griffiths, of Blackpool, who weighs over 19 st. In addition to the passenger and exhibition flights, a speed contest was flown for the *Weekly Dispatch* Trophy and money prizes of 35 sovs. The first heat was over six laps of the aerodrome, and produced five starters, as follows: R. H. Carr on a 50 h.p. G.-W. 'bus (4 mins. 26 secs.), Marcus D. Manton on another 50 h.p. G.-W. 'bus (3 mins. 56 secs.), Pierre Verrier on the 70 h.p. Maurice Farman (2 mins. 10 secs.), B. C. Hucks on his 80 h.p. Blériot "Tornado" (28 secs.), and Philippe Marty on the 50 h.p. Morane-Saulnier (scratch). Manton retired at the end of the second lap, and Carr kept ahead until the end of the last lap, when he was passed by Verrier and then by Hucks, who had been making good progress. Hucks was unable to overhaul Verrier, who crossed the line just 1 sec. ahead. Carr came in third, 6 secs. after Hucks and 2 secs. in front of Marty—an exceptionally good finish. The second heat, also of six laps, put up six starters:—R. T. Gates on a 50 h.p. G.-W. 'bus (4 mins. 34 secs.), W. Birchenough also on a 50 h.p. G.-W. 'bus (4 mins. 29 secs.), Louis Noel on the 20 h.p. G.-W. Maurice Farman (2 mins. 29 secs.), W. L. Brock on the 80 h.p. Blériot (47 secs.), Claude Grahame-White on the 50 h.p. Morane-Saulnier (5 secs.), and R. Slack on the 80 h.p. Morane-Saulnier (scratch). This heat also resulted in a close finish, Brock and Grahame-White coming in first and second respectively. The latter put up a hard fight to come in first, gradually gaining on Brock throughout the race, and being only 4 secs. behind at the finish. Noel came in third, 3 secs. after the second man, Slack following 8 secs. after, passing Gates almost on the "post." Birchenough retired. The final heat of eight laps finished up practically in the order of starting. Verrier, who received 2 mins. 20 secs., came in first, 18 secs. in front of Brock, who started second with 9 secs. Hucks, who was at scratch, eventually overhauled Grahame-White, the third man to start with 5 secs., and beat him by 7 secs. The times and handicap of the final heat were as under:—

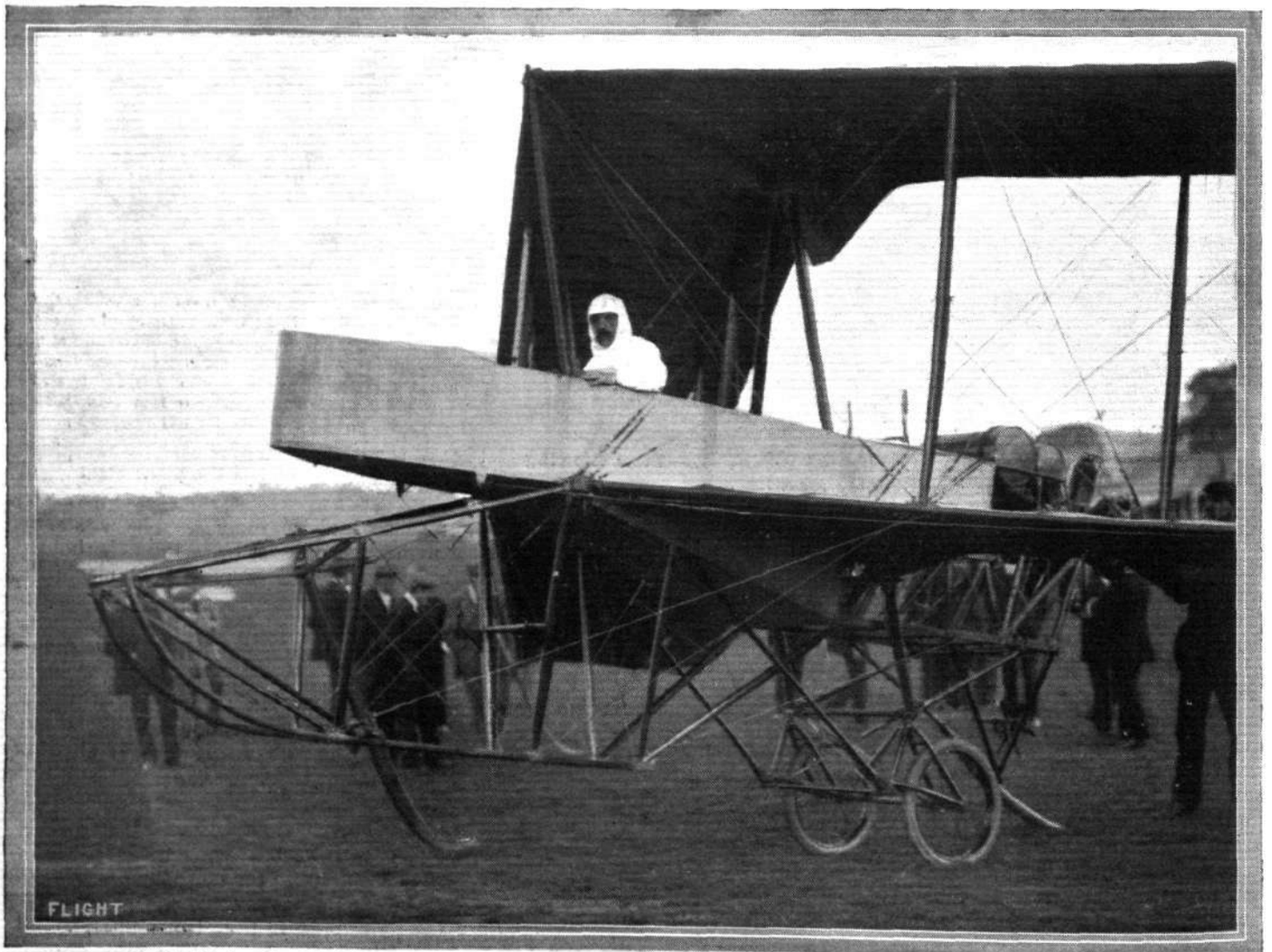
Speed Handicap for *Weekly Dispatch* Trophy (Final heat).

1st prize, 20 sovs.; 2nd prize, 10 sovs.; 3rd prize, 5 sovs.

		Handicap.	Handicap Time.
		m. s.	m. s.
1.	Pierre Verrier (70 h.p. Renault-Maurice Farman biplane)	2 20	13 5
2.	W. L. Brock (80 h.p. Gnome-Blériot monoplane)	0 9	13 23
3.	B. C. Hucks (80 h.p. Gnome-Blériot monoplane)	scratch	13 27
4.	Claude Grahame-White (50 h.p. Rhone-Morane-Saulnier monoplane)	0 5	13 34

Edgware Meeting, Saturday.

The visitors to Hendon last Saturday certainly got full value for their money, for they witnessed a splendid afternoon's flying, and the racing was particularly good. No fewer than 18 well-known pilots were to be seen in flight during the afternoon, about 14 different machines being in commission. Two pilots of the early days at Hendon also made a welcome reappearance, Henri Salmet and "Jimmy" Valentine, both making flights in the former's 80 h.p. *Daily Mail* Blériot. The American winner of the recent

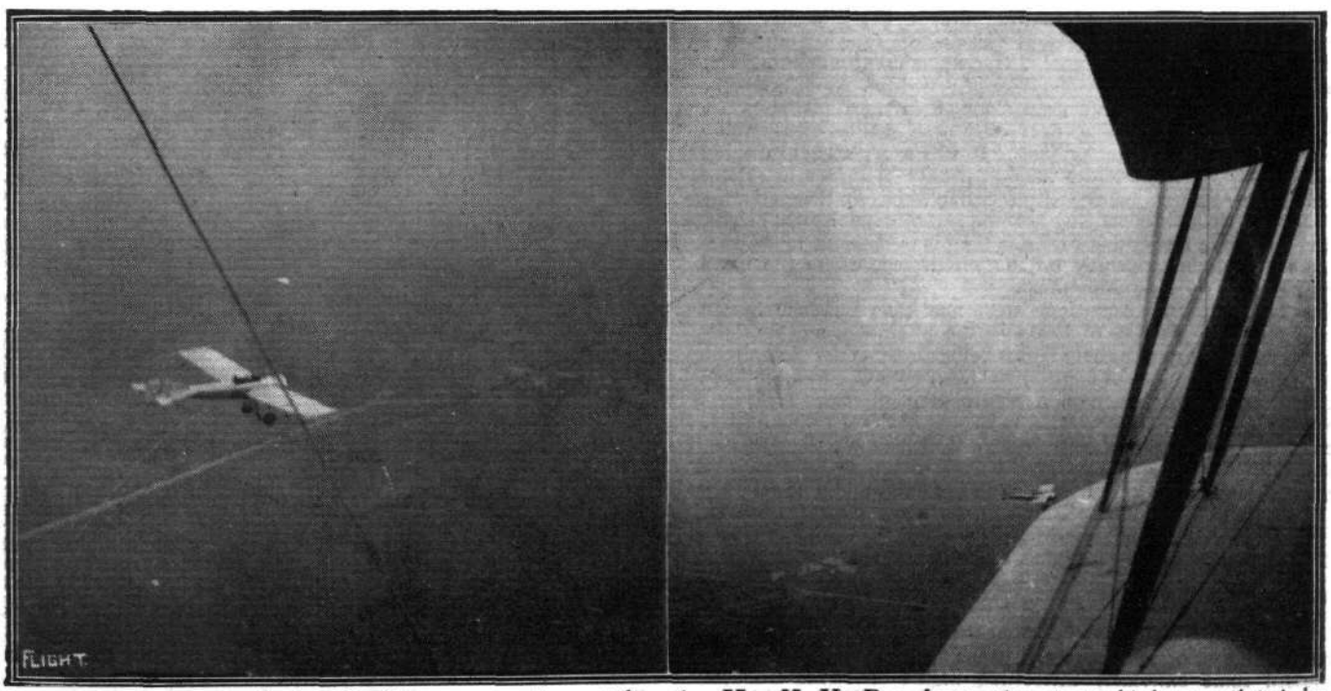


Commander Felix in the pilot's seat of the Dunne aeroplane at Hendon on Saturday. Our photograph shows very clearly the chassis and the arrow front section of the Dunne biplane.

International Gordon-Bennett balloon race, Mr. Upton, and his travelling companion, Mr. Preston, were amongst the visitors who made flights with Pierre Verrier on the Maurice Farman. From 2.15 p.m. until about 3.30 p.m. numerous exhibition and passenger flights were made by R. H. Carr, W. Birchenough, and Marcus D. Manton on 50 h.p. G.-W. 'buses, Louis Noel and Pierre Verrier on Maurice Farmans, Philippe Marty and R. Slack on 50 h.p. and 80 h.p. Morane-Saulniers respectively, W. L. Brock and B. C. Hucks on 80 h.p. Blériots, whilst G. Lee Temple flew over from Acton—where he was giving exhibition flights—on his Blériot at a height of about 3,000 ft. After making a spiral descent to about 1,000 ft., he returned from whence he came. Lewis Turner, who looked much the better for a well-deserved rest, also went up on the 60 h.p. Caudron. Shortly after 3.30 p.m., a start was made for the speed handicap. The first heat was over six laps of the aerodrome, and was made up as follows:—R. H. Carr on the 50 h.p. G.-W. 'bus (4 mins. 19 secs.), Lewis Turner on the 60 h.p. Caudron (2 mins. 32 secs.), Pierre Verrier on the 70 h.p. Maurice Farman (1 min. 43 secs.), W. L. Brock on the 80 h.p. Blériot (16 secs.), and Philippe Marty on the 50 h.p. Morane-Saulnier (scratch). Turner slowly but surely overhauled Carr, and retained the lead throughout, Brock and Marty following him up close behind. Brock was very nearly overtaken by Marty, and only just got in second, 3 secs. behind Turner and 2 secs. ahead of Marty, Carr following the latter 21 secs. behind. Six lined up for the second heat of six laps, viz.: R. T. Gates on the 50 h.p. G.-W. 'bus (4 mins. 44 secs.), W. Birchenough on a similar machine (4 mins. 40 secs.), Marcus D. Manton on the new 50 h.p. G.-W. 'bus (3 mins. 58 secs.), Louis Noel on the 70 h.p. Maurice Farman (2 mins. 27 secs.), Claude Grahame-White on the 50 h.p. Morane-Saulnier (10 secs.), and R. Slack on the 80 h.p. Morane-Saulnier. Birchenough starting almost simultaneously with Gates had a very bad time of it with the back draught from the latter's propeller, and retired after the first lap. Manton was not very long in passing Gates and got home an easy first. Grahame-White overhauled Gates and Noel on the last lap and got in second, Noel getting ahead of Gates almost on the line, and coming in third 6 secs. after Grahame-White and 1 sec. in front of Gates. Slack made a grand effort to pass his rivals but was unable to succeed, neither gaining nor losing on Grahame-White's handicap, and so came in last, 3 secs. after Gates. The final heat of eight laps proved to be most exciting. The limit man was Manton (4 mins. 4 secs.), Turner being next (2 mins. 50 secs.), then Brock (5 secs.) and Grahame-White at scratch. During the first few laps Brock seemed to gain on Grahame-White, but towards the end the latter gradually drew closer, both in the meanwhile slowly overhauling Manton. At the end of the last lap these three came along in a bunch with Manton still leading and Brock next. A few yards in front of the finishing line, however, Brock passed Manton and simultaneously Grahame-White shot forward and crossed the line abreast of Brock, Manton being only one second behind. First place was therefore given as a dead heat—a thing that has happened at Hendon but once or twice before. Just before the final heat took place some considerable excitement was caused amongst the visitors by the appearance of the Dunne biplane, which had made a very successful trial flight the day before in spite of a badly running engine. The latter had only just been replaced in the machine after an overhaul and a preliminary run outside the shed seemed to show an improvement. Commandant Felix got into the pilot's seat and started off towards the north end of the aerodrome. After a somewhat long run the biplane rose to a height of about 10 ft. The pilot then tried to climb higher still, but only got up another 5 or 6 ft. or so, and in doing so the biplane lost speed and "stalled," the left wing-tip striking the ground with some force, breaking the skid. The wing-tip being at some distance at the rear of the machine, so to speak—owing to the V-plan form—undoubtedly prevented a nasty smash, for what would have resulted in a "cart-wheel" in the case of an ordinary machine, only caused the biplane to dive forward on to the chassis. After running a short distance across the ground, the biplane came to rest, and was eventually taxied home. After the speed contest the meeting was brought to a rather spectacular close, for no fewer than ten machines ascended and flew around the aerodrome together. It was a really grand sight, and they looked for all the world like a swarm of Brobdingnagian gnats in the rose-tinted sky. The ten machines consisted of the three G.-W. 'buses with Birchenough, Carr and Manton up, two Caudrons (Baumann and Goodden), two Maurice Farmans (Noel and Verrier), two Morane-Saulniers (Marty and Slack), and Brock's Blériot.

Speed Handicap. Final Heat (8 laps).	Handicap.	Handicap Time.
	m. s.	m. s.
1. C. Grahame-White (50 h.p. Morane mono.)	0 5	15 57
2. W. L. Brock (80 h.p. Blériot mono.) ...	scratch	15 57
3. M. D. Manton (50 h.p. Grahame-White bi.)	4 4	15 58
4. Lewis Turner (60 h.p. Caudron bi.)... ...	2 50	16 5

Sunday was a trifle more windy, and certainly colder than the day before, but there was, nevertheless, a very good attendance, and plenty of flying. W. Birchenough, R. H. Carr, and Marcus D. Manton were kept busy all the afternoon taking up passengers on the 50 h.p. G.-W. 'buses, Noel and Verrier being likewise engaged on their respective Maurice Farmans. Gustav Hamel, R. Slack, and Philippe Marty put up some fine speed work on their Morane-Saulniers, the first two taking up passengers. B. C. Hucks and W. L. Brock were out on their 80 h.p. Blériots, also taking up passengers, whilst G. Sabelli, a Hendon favourite, fresh from the war in Bulgaria, make a flight in Brock's Blériot. J. L. Hall also came out on his 35 h.p. Caudron.

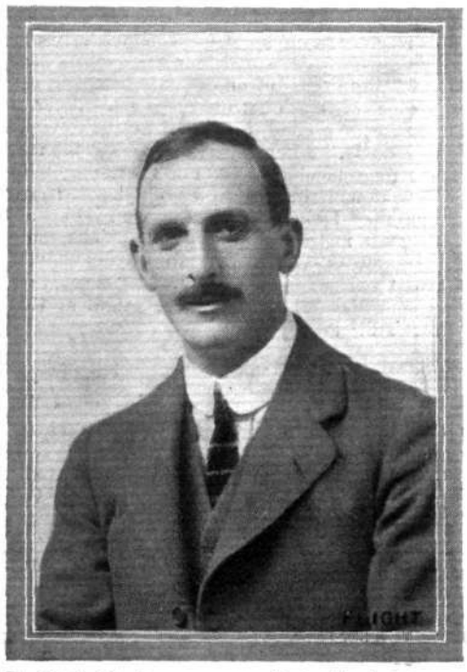


A couple of snaps of the Blackburn monoplane, taken by Mr. H. V. Roe from the Avro biplane, piloted by Mr. F. P. Raynham in the Yorkshire Air Race between York and Doncaster on October 2nd. Both competitors were well up, and by the photographs it will be seen the weather was extremely wretched with a haze over everything.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Grounds.

ON Sunday, last week, Mr. Jezzi made a few circuits on his biplane. Gordon Bell arrived about 5 p.m. on a new Sopwith biplane for the Admiralty, and flying at a great height, he passed over the village, descending on the aerodrome with a beautiful spiral. The machine is of the same type as already supplied to the Admiralty, and on which Lieut. Davis, R.N., has accomplished some very fine flights. On Monday, the new Bristol biplane performed the necessary tests, the pilot being Mr. Sippe. Lieut. Finch Noyes, R.N., has been extremely busy each day from 6.30 a.m. and again in the afternoon with instructional work on the old-type Bristol-Farman and a Short. Some of the beginners should qualify for their *brevets*



Mr. J. B. Hart Davies, a new pilot who has secured his *brevet* at the Grahame-White School, Hendon.

shortly, as quite respectable flights have been made, one in particular proving himself very apt by his nicely-judged "banked" turns and landings.

On Tuesday afternoon there were over a dozen machines on parade in full mobilisation order, of which number the majority were of the well-known Short type. The flight consisted of Shorts, Maurice Farman, Deperdussins, Blériot, Caudron, Avro, Sopwith, and Bristol. The whole squadron made off in the direction of the Isle of Grain, and passing over Sheerness, caused considerable excitement among the inhabitants. It was a remarkable display of airmanship, pilots handling their respective machines in superb style. The return journey was accomplished in the gathering darkness, the machines arriving over the aerodrome at a great height, and it was quite fascinating to watch the pilots descend in a series of spirals to alight gracefully on the aerodrome, where the naval working party were awaiting them.

On Thursday two excursions were made, to Chatham in the morning and to the Isle of Grain in the afternoon, among those piloting machines during these flights being Commander Samson on a Deperdussin; Capt. Lushington, R.M.A., on a Caudron biplane; Leading Seaman Bateman on a 70 h.p. Renault-engined Maurice Farman; Capt. Courtney, R.M.L.I., on a Short; Sub-Lieuts. Pierce, Marix, Rainey, Lieut. Miley, R.N., all on Shorts; also Lieut. Edmunds, R.M.L.I., Sub.-Lieut. Littleton on Avro 41. All the planes landed on Grain Island, and after a short interval returned to Eastchurch Aerodrome. The squadron flight to Chatham in the morning was a non-stop trip. Mr. McClean has been out this week and made several passenger flights.

Brooklands Aerodrome.

DELIGHTFUL weather favoured the postponed meeting of the British Motor Cycle Racing Club, after the holding of which a goodly number of the spectators adjourned to the flying ground, where they witnessed some extremely interesting flights on the Martinsyde monoplane, the Bristol biplane (Mr. Pixton), the Parsons biplane (Mr. Vincent Waterfall), the Flanders biplane (Mr. Dukinfield Jones), and the Sopwith biplanes, Mr. Hawker having recovered sufficiently to take the air once more. Mr. Barnwell took three-quarters of an hour to cover 55 miles from a place in Sussex on the Blériot monoplane in misty weather.

On Sunday the weather was rather gloomy, and strong and gusty winds prevented many machines coming out, but the Martinsyde monoplane in the hands of its capable pilot seemed to fairly revel in the strong wind, the steadiness of its flying being particularly noticeable, and on it the winner of the ballot for the free passenger flight—Miss Edie de Lisle, of 76, Felsham Road, Putney—enjoyed a trip. Mr. Vincent Waterfall was flying well on the Parsons biplane.

It is anticipated that during the coming week a notable addition will be made in the shape of an up-to-date Bristol tractor biplane, fitted with an 80 h.p. engine, and the presence of this machine at the Bristol school will doubtless attract an even greater number of pupils. There will then be five up-to-date tractor biplanes, namely, Sopwith, Avro, Bristol, Flanders, and Parsons, and an early opportunity will be taken of matching them against one another in a cross-country race, the result of which will be most interesting.

Bristol School.—Very foggy first thing on Monday last week. Later, Merriam with Lieut. Spence and Capt. Wallace, twice; Later with Lieut. Hinds, Lieut. MacNeece then alone for first time doing very good straights. Pixton with Lieut. Hinds and Mr. Finny. In the afternoon, Merriam first out, taking Lieut. Spence on figures of eight and giving him landing practice, then this pupil went out for his ticket, for which he qualified in fine style, landing close to mark. Pixton afterwards up with Lieut. Hinds and Mr. Finny, also with Mr. Alford, and Merriam with Lieut. Newton, testing engine of biplane. Merriam up behind Capt. Wallace, Lieut. Hinds and Mr. Finny, the former twice, and the latter two once each. Capt. Wallace then alone for first time doing good straights. Lieut. MacNeece also doing very good straights. Lieut. Warren a solo reaching 500 ft. with a spiral descent, engine off, in good style.

Pixton for a flight on Tuesday with Mr. Finny as passenger. Lieut. Robertson two circuits in passenger's seat, and later several straights with Pixton behind. Lieut. Hinds several straights with Pixton behind, and then sent for first solo, flying for about 10 mins. at a good height, and landing well. Later Pixton with Lieut. Finny

Mr. C. Draper, who has recently taken his Royal Aero Club certificate at the Grahame-White School, Hendon.

as passenger for 10 mins. Lieut. MacNeece for two excellent solos. Capt. Wallace two solos. Lieut. Warren two high solos, and Lieut. Hinds for a solo. Too windy in the evening for flying.

On Wednesday Pixton with Lieut. Bridson—a new pupil—for first flight, doing one circuit. Pixton again with Lieut. Bridson and then Capt. Wallace for a solo. Lieut. MacNeece also for a solo. Rising wind finished the morning's work. In the afternoon Pixton for test with Mr. Finny. Pixton passenger flights to the following:—Lieut. Bridson three circuits and straights, Mr. Finny one flight, and then one in pilot's seat. Solos by Capt. Wallace,

Lieut. Treeby, Lieut. MacNeece, and Lieut. Hinds, one long flight each. Pixton finished afternoon's work by giving a flight to a prospective pupil.

Pixton first out for a test on Thursday. Then gave tuition to the following: Lieut. Bridson, two high flights; long flight to Lieut. MacDonnell, a new pupil; M. Robertson one flight in passenger's seat, then another in pilot's seat, doing straights and circuits. Capt. Wallace, Lieut. MacNeece, Lieut. Hinds, Lieut. Treeby made two long solos each. Capt. Wallace made a short solo, and then made a good flight for his *brevet*, observed by Mr. Rance. Pixton two long passenger flights to Lieut. Bridson and Lieut. MacDonnell. Two long solos each by Lieut. MacNeece, Lieut. Hind and Lieut. Treeby.

In the afternoon Pixton first for test, and then a flight with a passenger, and a flight to a prospective pupil. Two long passenger flights were given to Lieut. Ames, and one each to Lieut. Bridson, Mr. MacDonnell, and Mr. Finny, the latter pupil then being put in pilot's seat for several straights and circuits, he then made a third flight alone, and did two circuits in good style. Two long solos were made by Lieut. Hinds and Lieut. MacNeece.

Foggy first thing on Friday. Then Pixton for test, taking Mr. Newton as passenger. Pixton then with Lieut. Bridson and Mr. MacDonnell straights and circuits. Long solos were put up by Lieut. Warren, Lieut. MacNeece, and Lieut. Hinds. Rising wind prevented further flying.

On Saturday Pixton up with Mr. MacDonnell and Lieut. Robertson for tuition, and then up with Lieut. Bridson and Mr. Finny, who were in pilot's seat. Mr. Finny for a good solo, doing circuits in good style. One solo each was done by Lieuts. Hinds, MacNeece and Warren. Lieut. Hinds for a solo. In the afternoon Pixton for a test with a passenger. Then behind Lieuts. Bridson and Robertson and Mr. MacDonnell.

Howard-Flanders School.—Monday, last week, in afternoon, Dukinfield Jones up one or two short flights, and then 2,000 ft. for 20 mins. Early next morning he was up again for 25 mins., and later for ¼ hr. On Thursday, in morning, up again for ½ hr., and Friday for 20 mins., ¼ hr., and 25 mins.

Saturday afternoon, Mr. Jones was up for 10 mins., and then ½ hr., reaching 3,000 ft.

Herr Willy Voigt who has recently taken his *brevet* at the Bristol School, Lark Hill, Salisbury Plain.

Vickers School.—Monday last week. In forenoon Paterson on biplane 21, with Messrs. Macdonell, Pelham, and Coles. Barnwell with some pupils. Knight on biplane 20, solo, and with Lieut. Batty-Smith. Barnwell testing No. 3 mono. Mr. Joubert de la Ferte straights. In afternoon, Knight on biplane 21, with Messrs. Truman, Kinsman, Coles, Batty-Smith. Paterson on biplane 20, with Messrs. Macdonell, Pelham, Pierson. Mr. Joubert de la Ferte straights on No. 3 mono.

In morning, Tuesday, Paterson on biplanes 20 and 21, with Messrs. Macdonell, Kinsman, Pelham, Pierson, and Coles. Messrs. Kinsman, Howell, and Pierson solos.

Knight on biplane 20 with Messrs. Coles, Macdonell, and Batty-Smith, Wednesday morning. Paterson on biplane 21 with Messrs. Pelham and Malcolm. Messrs. Kinsman, Pierson and Batty-Smith

Capt. G. Henderson, one of the latest pupils at the Bristol School at Brooklands to secure his Royal Aero Club certificate.

solos. Knight test No. 3 mono., Mr. Joubert de la Ferte straights. In afternoon, Knight on biplane 20 with Messrs. Pelham, Coles, Malcolm and Frankland. Paterson test No. 5 mono., Mr. Newton-Clare solo circuits.

Thursday morning, Knight on biplanes 20 and 21 with Messrs Pelham, Coles, Malcolm, Macdonell, and Truman. Paterson with Messrs. Pelham, Macdonell and Truman. Messrs. Kinsman, Pierson, Batty-Smith, Malcolm and Coles solos. Capt. Wood on No. 3 mono., No. 5 mono., and biplane 21. Paterson and Mr. Newton-Clare on No. 5 mono. Paterson test No. 3 mono. Mr. Joubert de la Ferte straights. In afternoon Paterson testing biplane 20 with new Gnome engine, then on biplane 21 with Messrs. Frankland and Truman. Knight on biplane 20 with Messrs. Frankland, Macdonell, Batty-Smith and Truman. Messrs. Coles, Pelham, Frankland and Malcolm solos. Mr. Joubert de la Ferte straights on No. 3 mono.

Friday, in morning, Knight on biplane 21, with Capt. Macdonell, Paterson with Capt. Truman. Mr. Pierson solo. In afternoon, Barnwell test biplane 20, then with Major Kinsman. Messrs. Malcolm and Coles solos, the latter landing heavily slightly damaging machine. Barnwell on biplane 21, with Messrs. Frankland and Macdonell. Paterson with Capt. Pelham. Knight test No. 3 mono. Mr. Joubert de la Ferte and Mr. Webb straights.

Knight on biplane 21 Saturday morning with prospective pupil, and then with Capt. Frankland. This pupil then solo, landing very heavily, doing considerable damage to the machine.

Liverpool Aviation School, Waterloo.

Saturday last, Melly out on two-seater in a fairly strong wind, and flew round the Freshfield hangars and back at a height of 1,500 ft. in 26 mins., finishing with a figure eight in front of the hangars.

The actual amount of cheque to Mrs. Cody, as a result of the flying at Aintree Racecourse on September 27th, was £101 4*s.* 9*d.*, which has been most gratefully acknowledged by both herself and Mr. Leon Cody.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Monday last week Messrs. R. J. Lillywhite, Uga Von Segebaden, Clarke and Cripps straights with Mr. Noel in passenger seat, afterwards Mr. Lillywhite solo straights. Messrs. W. Strange and Kidd circuits. Mr. H. E. Coleman (new pupil) rolling with Mr. Noel. Next day Messrs. Francis and Cripps straights, with Instructor Manton in passenger seat. Mr. W. Strange circuits and figures of eight, and later Mr. Cripps solo straights.

Messrs. Clarke, Von Segebaden, and Francis straights with Mr. Birchenough. Thursday, Mr. Strange solo circuits. Mr. Edridge Green and Mr. Cripps straights and circuits with Mr. Birchenough. Mr. Coleman rolling with instructor. Mr. L. C. Kidd circuits, and Mr. Lillywhite solo straights.

Mr. D. W. Clappen, who took his *brevet* at the Bleriot School, Hendon, on August 15th.

Friday, Messrs. Segebaden, Cripps, Edridge Green, and Clarke straights with Mr. Birchenough. Mr. Kidd solo circuits and figures of eight. Mr. Strange circuits. Mr. Howarth (new pupil) rolling with Mr. Noel. Mr. Coleman rolling with Mr. Birchenough.

Mr. Strange solo circuits. Saturday, Mr. L. C. Kidd solo circuits and figures of eight.

W. H. Ewen School.—On Monday, last week, school was out at 4 p.m. After test flight by Mr. F. W. Goodden on 35 h.p. Caudron No. 2, Capt. Jenings did circuits. Messrs. Badgery, Scott, Carruthers, Cowling and Lieut. Fraser were rolling on 35 h.p. Caudron No. 1.

The weather was not favourable for the following two days, but on Thursday the pupils were out at 6.15 a.m. Mr. F. Goodden made a test flight on Caudron No. 2, after which Capt. Jenings did circuits on same machine. He then went through his *brevet* tests in excellent style, reaching a high altitude and landing well. On No. 1, Messrs. Badgery, Carruthers, Cowling, Murray and Lieut. Kinnear rolling and hopping, and Scott and McGregor straights. Afternoon M. Baumann on the 60 h.p. Caudron for 40 mins.

The next morning, Friday, the wind was too high for pupils' practice, but it dropped later, and at 4 p.m. the school was out. After test flight by M. Baumann on No. 1, Messrs. McGregor and Scott did good straight flights. Mr. C. George did circuits and figures of eight on same machine, after which he went through the first half of his *brevet* tests in excellent style, but it was too dark and foggy for him to continue. On No. 2 test by Mr. F. Goodden, after which Messrs. Carruthers, Cowling and Lieut. Kinnear were rolling, Mr. H. Johnson, a new pupil, received his first instruction, and Lieut. Fraser was doing straights.

ROYAL FLYING CORPS (MILITARY WING).

WAR OFFICE summary of work for week ending October 17th :—

No. 1 (Airship) Squadron. Farnborough.—The "Beta," "Delta" and "Eta" have all been out most days this week carrying out reconnaissance and instructional flights, the latter usually at night. On the 14th these three airships took part in a tactical exercise which formed part of the inspection of the R.F.C. (M.W.) at Farnborough by the G.O.C. in C. Aldershot Command.

No. 2 Squadron. Montrose.—Capts. Becke, MacLean and Todd arrived from Farnborough on BE 2 machines during the course of the week. Lieuts. Dawes and Lawrence are now on the way up to Montrose by air.

No. 3 Squadron. Netheravon.—Several long cross-country flights were carried out by the pilots of "A" and "C" flights during the week. The newly-joined officers were also out most days practising.

No. 4 Squadron. Netheravon.—The pilots of "A" and "C" flights were out occasionally, but the week was chiefly devoted to continuing the overhaul of machines, and to settling down in the new barracks.

No. 5 Squadron. Farnborough. — The machines of this squadron were out daily. On the 14th they took part in reconnaissance work during the inspection by the G.O.C. in C. Aldershot Command.

Flying Depôt, Farnborough. — Experimental work on BEs and M. Farmans was continued ; Flying Depôt machines also took part in the G.O.C. in C.'s inspection.

General News.—Gen. Sir Douglas Haig inspected the units of the R.F.C. (M.W.) stationed at Farnborough on the 14th. After inspecting the personnel, the aircraft and the Mech. Transport on parade, he proceeded to carry out a tactical inspection. For this three airships and eight aeroplanes were employed. Training of recruits has now been considerably augmented. The new recruits' course includes instruction in drill, revolver shooting, gymnastics, swimming and athletics—also in practical and theoretical instruction in technical work of various kinds. A portion of the new barracks at Netheravon has been taken over and occupied.

It was too foggy early on Saturday morning for flying. Later M. Baumann on *brevet* machine, and Lieut. Fraser doing straights.

Hall School.—Monday, last week, J. L. Hall flying Caudron ; later, Scotland made a flight on 35 machine, and on Tuesday he was flying eights on Caudron.

Wednesday and Thursday, Hall exhibition flying, and on Friday banked turns on Caudron. 50 Gnome monoplane now practically ready, and should be put through its test flights next week by J. L. Hall. Hall made short flight Saturday evening on Caudron ; joy ride after hard day's work.

Salisbury Plain.

Bristol School.—Weather too bad for tuition on Monday morning last week. In the evening Jullerot for a trial on a biplane, then gave tuition to Lieuts. Dunn and Harrison, and Air-Mechanic Locker. Mr. Voigt did a good solo, and then completed the first half of his ticket in fine style.

On Tuesday, weather too bad for tuition in the morning. Jullerot a trial on a biplane in the evening, but found too bumpy for tuition. Later tried again, but still too bad. Jullerot with Merriam on a school biplane on Wednesday. Good solos by Capt. Buckland, Lieut. Gallaher, and Mr. Voigt. Merriam giving biplane tuition to Lieuts. Dunn and Harrison. Jullerot with Lieut. Harman (new pupil) on tractor biplane. In the evening, Merriam a trial on biplane, and then took for tuition Capt. Bay, giving him landing practice. Merriam also gave tuition to Lieut. Harrison, two flights, Lieut. Dunn two flights, and Lieut. Harman two flights. Excellent solos were executed on a biplane by Capt. Buckland, two ; Lieut. Gallaher, two, Capt. Hay, one. Mr. Voigt went for and completed the second half of his *brevet* successfully. Merriam for his first solo on tandem monoplane, and afterwards did two other good solos. On a fourth trip he took Capt. Hay for his passenger.

Jullerot a trial on biplane on Thursday, then tuition to Lieut. Dunn. Merriam two long flights on tandem monoplane at good height with good *vol planés*. Jullerot and Voigt on tractor biplane to 1,500 ft. in 5 mins. descending with engine completely cut off. Excellent solos were done by Lieut. Gallaher, two, and Capt. Buckland, two. Merriam gave biplane tuition to Lieut. Harrison, Lieut. Harman and Capt. Buckland. In the evening Jullerot up with Mr. Voigt in the pilot's seat, Jullerot, with Merriam as passenger, for a flight on a tractor biplane, landing with a splendid *vol plané* from 2,000 ft. with engine cut off. Prince Cantacuzene for a 20 min. flight at about 1,200 ft. Merriam gave biplane tuition to Lieuts. Harrison, Dunn, Huish, Harman, and Air-Mechanic Locker. Voigt gave biplane tuition to Lieut. Dunn and Air-Mechanic Locker. Excellent solos were executed by Capt. Hay and Lieut. Gallaher. On the tandem monoplane Merriam at a good height, and afterwards gave tuition to a passenger.

Too foggy for tuition first thing on Friday. Later Merriam made a trial, and afterwards took Lieut. Harrison for tuition, the wind meanwhile getting gusty, and further tuition was abandoned.

In the evening Merriam a solo on tandem monoplane, then gave biplane tuition to Capt. Hay, giving pupil practice in *vol planés*, then gave tuition to Lieuts. Dunn and Marsh and Air-Mechanic Locker. Voigt tuition on biplane to Lieut. Marsh, Lieut. Dunn, Lieut. Harrison, Lieut. Harman, and Air-Mechanic Locker. Excellent solos on biplane by Capt. Hay, Lieut. Gallaher and Capt. Buckland. Merriam a solo on side-by-side monoplane, afterwards taking Mr. Voigt for tuition.

Merriam a trial on Saturday with Lieut. Harrison as passenger, then tuition to Lieut. Dunn. Jullerot biplane tuition to Lieuts. Huish and Harrison. Solos on biplane by Capt. Buckland and Lieut. Gallaher.

THE PASSING OF THE ZEPPELIN.

Apropos of the awful disaster which overtook the Zeppelin airship "L2" last week, the following very interesting letter has been sent to the Press by Sir Hiram S. Maxim :—

"A balloon in order to lift any considerable weight must be of great bulk, and if this great bulk is to be driven through the air at anything approaching a rapid rate the envelope holding the gas must be enormously elongated. The latest Zeppelin was 500 ft. long, and with this great length and bulk it not only requires a very large building to house such airships, but it is impossible to house them at all if there is anything like a wind blowing at the time. The great trouble, however, in their management is not by any means the worst difficulty to be encountered, as I intend to point out. When any object is driven through dry air at a high velocity it becomes charged with static electricity and gives off blue flame and sparks.

"About thirty-five years ago a large and powerful tug boat belonging to Jersey City was equipped with a new and extra strong boiler of the locomotive type. When it was in position and all the pipes connected it was filled with water to the top gauge and fired, but it appears that something was the matter with the pressure gauge ; it failed to register anything but a low pressure and the safety valve was also out of order. The firing went on, and when the engineer and stoker thought they had about 40 lb. pressure per square inch there was really a pressure of about 400 lb. in the boiler. Under these conditions everything was favourable for a very destructive explosion, and when the pressure had mounted beyond the strength of the weakest part of the boiler there was a terrific report. The whole of the crown sheet was blown through the firebox, and as tons of hot water were shot out under this enormous pressure the boiler broke loose, tore its way through the deck, went up like a rocket, passed over the top of Taylor's Hotel, across a wide street and the top of Erie Railway Station, and fell to the ground. Had the explosion been the result of too little water or a weak spot in the boiler the effect would have been very much less. The explosion took place at about ten o'clock in the morning, when the thermometer stood at ten degrees below zero—forty-two degrees of frost, as we say in England. As the boiler passed over the roof of the railway station the lightning arresters of all the telegraphic instruments were one blaze of fire. It is probable that all the steam and water were out of the boiler by the time it passed through the deck of the boat ; therefore the electrical disturbance which caused the flash on the lightning arresters was produced by the friction of the very dry air on the surface of the boiler as it passed over the station, and not by the escape of the steam into the air.

"About the same time I put an arc light into the court of the Park Avenue Hotel, New York City. The framework of the building was of steel ; the countershaft for driving the dynamo was bolted to two pieces of scantling, and the scantling was bolted to the framework of the building. In one place one of the hangers of the countershaft came within an inch of the steelwork of the building, and about every half minute there was a bright electrical flash between the hanger and the framework. The countershaft became charged by the friction of the belts running through the dry air. I put on a pair of dry indiarubber shoes, held my hand near one of the belts, and then went to a gas burner, fully a hundred feet distant, which had been turned on without lighting, and with a spark from my finger I lighted the gas. I did this repeatedly.

"I made and installed the first electric light apparatus used in the New York Post Office. This was also during extremely cold winter weather. I stood up in a chair, holding in my right hand a pine stick eight feet long, which I had dipped in water ; I brought the other end of the stick near the main driving belt and lighted the gas with a spark from my left hand. If anyone standing on the concrete floor came near me a pale blue flame was produced.

"When a so-called airship is travelling at a high velocity through cold and dry air, it is very evident that it will cause electrical disturbances which will be strong enough to ignite hydrogen gas. I have often noticed in the States in cold dry weather that when a large leather belt is running at a high velocity every part of it appears to be alight with blue flame, and it is said that these blue flames are sometimes able to ignite dry dust in wood-working establishments. It has been suggested that we should seek a non-inflammable gas to take the place of hydrogen, but unfortunately there is no such gas, and not the remotest chance that one can be produced, So far we have not been able to create simple elementary bodies.

"It is quite possible that some electricians who have not had experience in a country where the air is very cold and dry may not agree with me regarding the electrical danger, but aside from this danger, big balloons 500 ft. long, and 40 ft. in diameter are excellent targets. It is not very difficult to provide projectiles large and small that will give off bright sparks in their flight. Then, again, an elongated balloon must always be at the mercy of a flying machine which is able to fly at double the speed.

"I am therefore strongly of the opinion that we have come to the end of our tether in dirigible balloons ; they are useless and practically impossible. It is nothing less than madness to sacrifice any more lives and treasure in attempting what is manifestly an impossibility."

L2, the unfortunate German Navy dirigible, before the awful disaster which overtook her last week. This clearly shows the arrangement of the three gondolas, the foremost of which accommodated the commanding and navigating officers, while the others contained the motors. The envelope was 525 ft. in length, while its greatest diameter was 54 ft.

ARMCHAIR REFLECTIONS.

By THE DREAMER.

Oh! That Any Could Be So Vile.

If somebody were to ask me at this moment to name the pictures I have on the walls at home, I should have to think very hard indeed to give a correct inventory. Yet I have little trouble to remember those we had at home in my childhood days. I remember one in particular—remember it principally, I suppose, because it used to hang in my bedroom, over my bed, and I have lain and looked at it for hours when I ought to have been trying to go to sleep, and when a light had been left to help me in that direction. It was a framed membership certificate of my father's to a society long since dead, known, I believe, as the Widows and Orphans. I remember it had a small picture in the middle showing a female in deep mourning holding a handkerchief to her eyes so that I could not see her face, and I used to think it was my mother. She was shaking hands with a man who I knew was not my father, but as he had one hand on her shoulder I knew he meant her well. I knew also that this was some society that men joined, and where they promised to protect the widow and orphans of any brother who should die, and I used to wonder who could ever think of hurting those left bereaved.

I did not know so much of the world as I do now, or I should have known that the widow was the fair prey, not only of men in the lower classes, but also of those who if they were asked, would describe themselves as gentlemen, and would be very much upset if they were told they were not. These reflections were brought into being by seeing that somebody has broken into the hangar of the late Col. Cody on Laffan's Plain, and stolen some twenty pounds worth of tools that were bought-in by a sympathiser to enable Cody's sons to continue their father's business. One would have thought that men in all stations of life were moved at the death of the gallant big-hearted Cody, and wished his widow nothing but well. It does not seem possible that there lives a man or men so vile in thought and deed, that they would think for one moment of doing such a thing, and yet it is so. I suppose that if ever they are brought to justice, there will be nothing for the judge to do but sentence them to about six weeks' hard labour, whatever his own thoughts on the matter may be. If I had my way, and, perhaps, if he had his, they would be exterminated. I am not at all in favour of capital punishment, and never have been, but I have seen far more valuable creatures taken into the Dogs' Home at Battersea to be placed in the lethal chamber.

Please Leave Aviation Out of It.

I have before me a cutting from the *Morning Advertiser*, which describes A. R. Bathurst as "well dressed," as "independent," and as an "aviator at Hendon." Mr. Bathurst was charged at Marlborough Street Police Court with wilfully damaging plate-glass in Poland Street, and with assaulting a police constable by hitting him with a soda-water bottle and kicking him, at four o'clock in the morning. It is quite possible that Mr. Bathurst is independent, which being so, he is probably well dressed. As to being an aviator, I have my doubts. There are many pupils of course, at Hendon, who are not known to me, and Mr. Bathurst may be one of them, but I do not see that the fact of a man joining a school in order that he may learn to fly, makes him an aviator right from the first day: I believe there is some little thing in the way of a certificate to be obtained before a man can really claim all the honour that the word conveys. It is, of course, quite possible for a man to be an aviator without caring to hold a certificate, the mere fact of owning a machine and flying it would make him that, but one would as soon think of a man being a V.C. and never going up for his cross, as a man being a skilled aviator and never taking his certificate.

Ladies, of sorts, when they get into trouble, describe themselves to the magistrate next morning as "actress," and I am sure the legitimate profession has suffered much in the past for this reason. If Mr. Bathurst really does intend to become an aviator I would like to impress it on him that he is joining an honourable profession, whose members do not as a rule go about fighting police constables with soda-water bottles in the early hours of the morning, and that if one of them did happen to make a little slip in this direction—as aviators are but human—he would not be too anxious to shout the aviation business, but would be more likely to describe himself as in anything but that. Men who take machines up in the air, often with the life of a passenger in their care, cannot afford to play "Old Harry" in the West End at four o'clock in the morning, and pupils, that is those worthy of the name, have by that time had their night's rest and are just thinking of turning out for early morning practice. In the doubt, I prefer to think that Mr. Bathurst is not an aviator, but if he is, or is hoping to become one, I counsel him to either change his mind or his ways. It's an uphill job as it is, to force the seriousness of aviation on the public mind—we don't want our aviators to be classed with roysterers, even with well dressed and independent ones.

An Aviator's Alphabet.

You ought to know aviation from A to Z; in case you don't, here it is:—

A is the aeroplane, Mono or Bi,
B is the *brevet*, or licence to fly.
C is the caution you take, or you won't.
D is the doctor you'll need if you don't,
E stands for engine—nor blemish nor spot,
F is the fire that it misses if not.
G is the ground, a good friend but bad master,
H the nice helmet that lessens disaster.
I intuition, a gift, not acquired,
J stands for judgment, above all required.
K is for kingdom, some parts are prohibited,
L stands for "lock-up"; transgressors exhibited.
M the mechanic, who knows every trick of it,
N "nothing doing," if once he gets sick of it.
O my opinion: "he ought to earn more."
P pilots' sympathy, with him, I'm sure.
Q is the question: When is he to have a "gate?"
R the reply: On ..... please will you fix a date?
S is the spark you need if you'd rise.
T the tail you'll keep up if you're wise.
U under-carriage—wheels, struts, and the rest,
V the *vol plané*, of pleasure the best.
W for wires, controlling the ruddering,
X the unknown—its use sets me shuddering.
Y for "Yours truly," whose "dreams" make you squirm,
Z stands for Zany, a similar worm.

BRITISH NOTES OF THE WEEK.

Edinburgh Aeronautical Society.

THE inaugural lecture this winter will be given by Mr. G. H. Gulliver, B.Sc., Lecturer on Aeronautics at Edinburgh University. The title of the lecture will be "Some Aeronautical Problems," and the meeting will be held at the Rutland Hotel at 8 p.m., Mr. R. Wilson in the chair. Members and friends admitted free; non-members may obtain sixpenny admission cards on entering. There will be lectures monthly during the winter.—G. T. Cooper, Hon. Sec.

Curtiss Flying Boat at Brighton.

AS was anticipated, the first trials of the Curtiss machine were very successful, and a large number of people have visited Volk's waterplane hangar, including representatives of the German Navy. There are many points that appear as outstanding features in this machine, notably the 90 h.p. engine, which throttles down in a remarkable manner. Mr. John D. Cooper, who has handled the 'bus since she has been at Brighton, has done a lot of steady flying, and his alightings have shown fine judgment. The machine flies with her tail well up, and takes the water easily. The flying boat will probably remain another week, and a word of appreciation should be given Mr. Volk for his energies in supplying Brighton with sound exhibitions of flying during the past season.

R.F.C. at Dover.

A DETACHMENT of the 5th Squadron of the Royal Flying Corps is now at Dover with a view to testing the possibilities of Dover as an aviation station. The officers and men are quartered in the Military Prison while the machines, including two Maurice Farmans, are housed in canvas hangars on Swingate Downs, which is being used as a flying ground.

A Busy Evening at Eastchurch.

WEDNESDAY of last week was the anniversary of the day when an unknown aircraft was supposed to have flown over Sheerness, and the aviators at Eastchurch decided to celebrate the occasion. At one time during the evening no less than eleven machines were in the air and eight of them subsequently flew over to Sheerness and manœuvred above the town for some time.

A Race at Hull.

ENGINE trouble unfortunately prevented the race from Hull over a circuit of 80 miles, *via* Beverley, Driffield, Market Weighton, Goole, Scunthorpe and Barton, from being carried through on Saturday. The entrants were Mr. Harold Blackburn, with his Blackburn monoplane, and Lieut. E. Copeland Perry with a Blériot. The latter was placed *hors de combat* while making a trial flight, while Mr. Blackburn, after getting in fine style to Beverley, made a heavy landing and damaged the chassis of his machine so that he could not continue.

Another Avro for the Navy.

A 100 H.P. Gnome-Avro sea biplane was delivered to the Royal Navy at the Isle of Grain on October 15th, Mr. Raynham putting it through its reception tests, which it performed in the most creditable manner. The climbing speed was 1,000 ft. in 4½ mins., 2,000 ft. in 9 mins., and 3,000 ft. in 14 mins., while the flying speed was well over 60 m.p.h. In the hour's flight, Mr. Raynham took the Admiralty inspector up to 4,000 ft.

British Government and Airships.

IT is understood that the Government has decided upon a policy, and we think a wise one, that in future the Navy shall have charge of all airships, the Army dealing with aeroplanes only. The Navy will take over the present Army airships, and use them for training crews for the larger airships, now under construction.

Testing the Bristol Tractor.

LAST week on Salisbury Plain Mr. Jullerot was testing the new Bristol tractor for the Roumanian Government. In rather misty weather he took up Mr. F. W. Merriam as a passenger to a height of about 3,000 ft., and the tests, although the engine was missing a little, were carried through without a hitch.

Mr. G. L. Temple at Hull.

ON the 10th inst., Mr. G. Lee Temple was at Hull, and gave an exhibition flight in a stiffish wind, and on Saturday week he made three flights, on one occasion getting up to 6,200 ft. He also went to Beverley and back. Four flights were made on the following Monday, Tuesday, and Wednesday week, and on the last day he flew to Driffield and back.

And at Acton.

LAST week Mr. Temple was at Acton, to which place he flew on his Blériot from Hendon on Saturday. After giving some exhibitions he flew back to Hendon and went out to Acton again. He gave a series of exhibition flights at Acton on Sunday.

A Lecture on Seaplanes.

AT the Royal United Service Institution on Wednesday of last week, Col. H. S. Massy read an interesting paper on "The Development of the Seaplane." The lecturer gave a *résumé* of the problems to be considered by the seaplane designer and also presented a lot of useful information regarding the specifications of various Governments for this type of flying machine. Major-General Arbuthnot presided at the lecture.

The Inquest on Col. Cody.

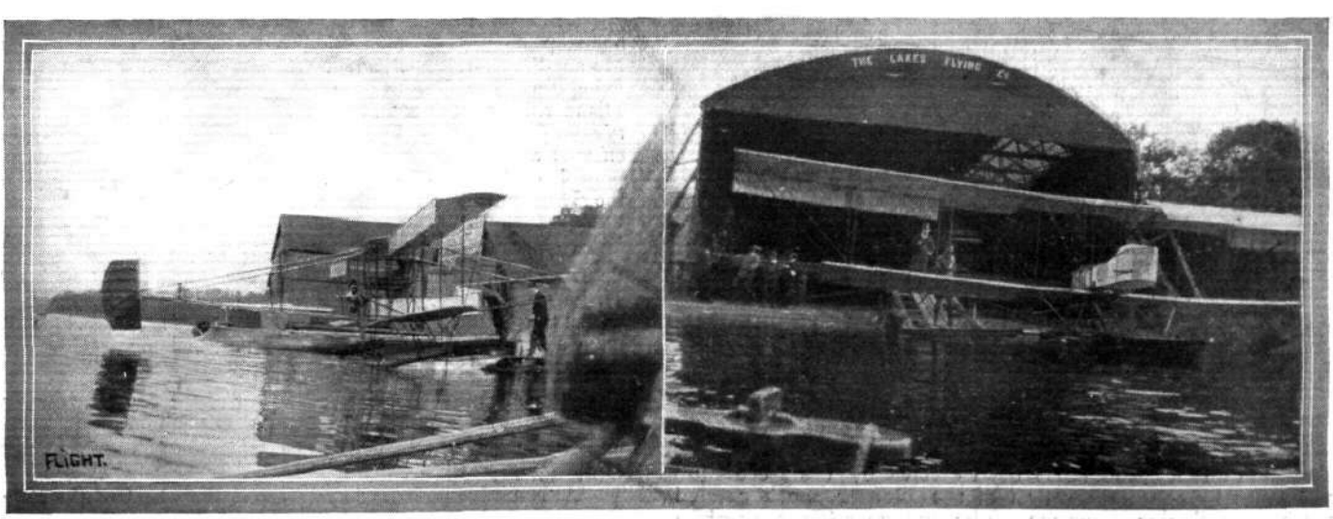
ON Wednesday of last week, the inquest concerning the fatal accident to Col. Cody and his passenger, Mr. W. H. B. Evans, was concluded at Farnborough. Mr. Mervyn O'Gorman, Superintendent of the Royal Aircraft Factory, attended and explained the report of the Royal Aero Club's Accidents Investigation Committee, after which the jury returned a verdict of "Accidental Death."

Snapshots at Crotoy.

BY an oversight acknowledgment was not made under the photographs of a Caudron machine at Crotoy which appeared in our last issue, that they were taken by Mr. Wm. L. Oddey, who secured them while enjoying a camping holiday at Crotoy.

Testing the Dunne Machine.

AN extraordinary demonstration of the remarkable stable qualities of the Dunne machine was given by Commander Felix at Hendon on Friday, last week. After going up to a height of 200 ft. or so, he left his seat and walked about in the cockpit, leaving the machine to go on its way uncontrolled; it flew in that manner for several minutes.



THE WATER BIPLANE OF THE LAKES FLYING CO. AT WINDERMERE.—On the right the machine is just seen before being taken back into the shed. These photographs were taken by Geoffrey Sleath, of Ilkley, Yorks, a little cripple boy of twelve, who is able to hold a camera. The lad is a keen follower of the model section of FLIGHT, the photographs being taken with a "Brownie" camera.

FOREIGN AVIATION NEWS.

A Dutch Passenger Height Record.

ACCOMPANIED by Lieut. Hopslee, Leo van Steyn, on his Henry Farman machine, on the 14th inst., improved the Dutch height record for pilot and passenger, going up to 1,950 metres in 52 mins.

Details of Stoeffler's Flight.

IN our last issue we recorded the fine flight of Victor Stoeffler on an Aviatik biplane, and we now supplement the details then given by a table which shows the stages and the rests between each. These are as follows :—

	Arrive.	Depart.	Total Distance.
	h. m.	h. m.	kiloms.
Johannisthal	—	12 2	—
Posen...	2 55	3 30	230
Johannisthal	6 5	6 45	460
Mulhausen	1 0	2 0	1,160
Darmstadt	4 55	5 0	1,410
Mulhausen	7 50	8 10	1,660
Darmstadt	10 20	10 32	1,910
Mulhausen	12 42	—	2,160

To Identify French Military Craft.

IN order that aeroplanes and airships belonging to the French Army may be distinguished from those owned by civilians, orders have been given that military aeroplanes are to have painted under each wing, or lower plane in the case of biplanes, a device in the national colours 1 metre in diameter. In the case of dirigibles, the name of the vessel will be painted on the nose of the envelope in large black letters, while at the stern will be carried a national flag surmounted by a tricolour burgee. Balloons when engaged on military service will have a national flag suspended from one side of the basket, and a tricolour burgee from the other.

The monument which has been erected by the Aero Club of France in commemoration of the pioneer work carried out by M. Santos Dumont. The inauguration took place on Sunday last, when M. Santos Dumont, during the ceremony of inauguration, was decorated with the ribbon of the Commander of the Legion of Honour by M. Barthou.

French Naval Officers and Long Distance Flights.

A CIRCULAR letter has been sent by the French Minister of Marine to the various naval authorities, pointing out that not only did a French officer, on leave, in flying to England, infringe the English regulations regarding flying over prohibited areas, but he also transgressed the service regulations. These stipulate that naval officers, whatever the mode of travelling, may not leave the country even in a private capacity, without a special permit from the Naval authorities. It is also pointed out that every aeronaut or aviator must be acquainted with and comply strictly with the regulations of the country he proposes to visit.

"Beaumont" as an Expert.

ON Saturday, Lieut. Conneau ("Andre Beaumont"), the winner of the 1911 *Daily Mail* Round Britain race, was appointed by the Paris Civil Court, as an expert to assist the judges on technical questions concerning aviation.

A Santos Dumont Memorial.

ON Sunday afternoon M. Leon Barthou unveiled the monument which has been put up in the park of the Aero Club of France at St. Cloud to commemorate the first flight made by M. Santos Dumont. The monument represents Icarus in flight, and on the pedestal is a medallion of the Brazilian sportsman, on whom M. Barthou announced the Government had decided to confer the dignity of a Commander in the Legion of Honour. After the ceremony, twelve balloons started from the ground to take part in a landing competition.

J. Vedrines Tries a Bathiat.

ON the 15th inst., during a visit to Mourmelon, Jules Vedrines was much interested in the work of the Bathiat-Sanchez machines, and made a short flight on one of the monoplanes. Bathiat flew from Mourmelon to Longivy in 55 mins., and then returned, while the Chilian, Lieut. Bolle, made one test for a superior *brevet*.

More Nieuport Superior Pilots.

LOUIS CHEVALIER, on the 15th, made a test for a superior *brevet* over the Villacoublay–Chartres–Orleans course, while L. Brullard made his final test by flying from Villacoublay to Mourmelon and back. The outward journey took 1 hour 15 mins., and the trip home a quarter of an hour longer.

A Farman Hydro for Sweden.

IN the presence of several Swedish officers, Chevillard at Boulogne on the 16th inst. carried out some tests with a Henry Farman hydro-aeroplane purchased by the Swedish Navy. With a passenger the machine climbed 720 metres in 14 mins., and in the speed test it was timed to do 92 kiloms. an hour.

Marseilles to Etampes Non-stop.

ALTHOUGH he did not quite succeed in his intention to make a non-stop flight from Marseilles to Paris, Garros on his 60 h.p. Morane-Saulnier, on Sunday, made a splendid performance by flying from Marseilles to Etampes, a non-stop flight of seven hours. His machine carried 200 litres of fuel and 50 litres of oil and flew *via* the Rhone Valley, Lyon, Moulins and Nevers, the landing being effected at Chevilly just by Etampes, further progress being impossible on account of the mist. As the distance is about 650 kiloms. the speed was about 108 kiloms. an hour.

Mme. de Laroche Flying Again.

WITH the intention of competing for the Femira cup, Mme. de Laroche has been practising at Mourmelon on her 80 h.p. H. Farman biplane. On the 17th inst. she flew, with Mme. Bathiat as passenger, to Rheims and back, and on the following day she made a flight of an hour's duration at Mourmelon.

A Farman Superior Pilot.

ON the 14th inst. a qualifying flight for a superior *brevet* was made by Marcel Gressard on a Farman machine over the Etampes–Vendome–Orleans course.

Guillaux Returns to the Caudron.

AFTER a long series of successes at the wheel of the Clement Bayard monoplane, Guillaux has decided to forsake the single-decker and return to his old mount, the Caudron biplane. He is now preparing to make a non-stop flight from Paris right across Germany to Russia.

Paris to Cairo by Air.

WE referred last week to the projected flight of Daucourt from Paris to Cairo on a Borel monoplane. A start was made from Issy on the 21st inst., at 8.20 a.m. A quarter of an hour later a call was made at Chateaufort for petrol. At a quarter past ten he started again, but was in trouble on reaching Sens, and in landing the chassis was damaged so much as to cause considerable delay. In the meantime the Austrian Government have forbidden the aviator to fly over Southern Hungary between Budapesth and Belgrade.

Stability Tests with a Farman.

FROM MM. H. and M. Farman we learn that some noteworthy tests were carried out at Etampes on the 15th inst. on an ordinary Farman. Rougerie, who is in charge of the Farman school at Etampes, "descended from 550 metres, *absolutely vertically* but with the machine remaining horizontal as if in ordinary flight, and with the motor stopped, without the machine oscillating in any way." Gougenheim, with an officer as passenger, later carried out a similar manœuvre, which should prove useful when bomb-dropping, &c.

Fatalities in Germany, Russia, and France.

LAST week-end was a particularly black one for aviation in Germany and France. On Friday, while Capt. Hässler and Lieut. von Freiberg were flying at Schweinitz, they had to make a sudden descent. The machine fell to the ground, and Capt. Hässler, the pilot, who had both his arms broken, was unable to get free from the wreck, and was burned to death. On the same day at Bamberg, in Bavaria, Lieut. Kock was flying with Sergeant Mante when the machine fell to the ground from a height of 400 metres, and both occupants were killed.

On Saturday a Russian military Kletchtinski and a mechanic were killed by their machine falling when flying in the Kaluga district.

On Monday Corporal d'Autroche was killed at Epinal while making a very steep *vol piqué*. Apparently while the machine was diving vertically to the ground the *nacelle* became detached from the *cellule*, and fell into the River Moselle. The pilot was rescued unconscious, but died shortly afterwards. Also on Monday a fatal accident occurred to Lieut. Garnier and Sapper Gendeau while making a flight from Buc to Epinal. They were close to Neufchateau, about 90 kiloms. from their destination, when their machine capsized and fell to the ground. Both the lieutenant and his mechanic were instantly killed.

From Belgium to Germany.

ON the afternoon of the 19th inst., Lanser set out from Kiewit (Belgium) to fly to Johannisthal. He landed at Odenkirchen, and stayed there for the night, going on in the morning, but he was forced to make another landing some distance from Neuss. Later in the day he started again and flew the short distance to Lohausen, just by Dusseldorf.

Thelen Flies Over 1,300 Kiloms.

AFTER flying over 1,300 kiloms., Thelen, on the 16 inst., finished his attempt for the all-German 24-hour prize by flying from Berlin to Koenigsburg and Stettin in the darkness.

Another Long German Flight.

ALSO, on the evening of the 16th inst., Lieut. Geyser started from Mulhausen, and arrived at Koenigsburg the next morning. After a rest of three hours he went on to Marienwerder, by which time he had covered 1,500 kiloms. He was accompanied throughout by a fellow officer.

Caster also Makes a Long Flight.

ON Saturday, Caster flying several times from Hamburg to Breslau and back and from Breslau to Liegnitz and back, succeeded in covering a distance of 1,450 kiloms. in 24 hours and so secured second place to Stoeffler in the contest for the prize for the best flight in 24 hours.

Slow Travelling in Germany.

STARTING from Insterburg soon after midnight on the 17th inst. with the intention of going to Paris, Langer found that he had to fight his way against a strong wind. Eventually, after eight hours' flying, he landed at Dreidorf, having covered only 200 kiloms. He therefore decided to return to this starting point and make another attempt.

Flying Over the Rhine.

ON a hydro-aeroplane built at Friedrichschafen, Ehrbardt, on the 15th inst., flew from the works, along the River Rhine to Mannheim. After replenishing he continued to Horchheim, near Coblentz, and then he had to stop owing to a slight mishap.

Long Flights in Austria.

LAST Wednesday week Lieutenant Blomer with a passenger arrived at the Aspern Aerodrome, Vienna, having flown over the Alps from Goertz, while Lieut. Sshmoezer, also with a passenger, went from Aspern to Banialouko in 3 hrs. 40 mins.

Pegoud at Vienna.

BEFORE a crowd, estimated at 200,000, Pegoud, on Saturday last, opened his continental tour at the Aspern aerodrome, Vienna. He gave his usual display of upside-down flying, looping the loop, and twists, and the performance was repeated on Sunday, when the pilot was congratulated by the Archdukes Leopold Salvator and Albert. Pegoud is to give exhibitions at Turin on Nov. 10th.

St. Petersburg to Moscow, &c.

IN an attempt to win the Romanoff prize for a flight from St. Petersburg to Moscow and back, Capt. Samoilo started from the Russian capital on a Nieuport monoplane on the 15th inst. He had to stop at Novgorod owing to a snowstorm, and after a rest of five hours managed to get on to Valdae. There it was too dark and cold to proceed that night, but on the following morning he finished the trip to Moscow with a three hours' non-stop flight. The return journey was commenced after a delay of four hours, during which the motor was overhauled, and good progress was made for three and a half hours, but trouble with the motor then put an end to the attempt at Vyschny-Voltchok. The distance between St. Petersburg and Moscow is about 370 miles.

Queen Wilhelmina Inspects her Flying Corps.

THE Dutch military centre at Soesterberg was visited by Queen Wilhelmina on the 14th inst., and although it was very cold and windy all the machines, which are of the Henry Farman type, made flights. Queen Wilhelmina was much interested in the work of the flying corps, and congratulated the officers on the progress made.

Chevillard Finishes his Tour.

STILL flying accompanied by Capt. Sunstedt, Chevillard, on the 5th inst. went from Oreblo to Christiania in 2 hrs. 40 mins., the journey being very trying as it included the crossing of mountains and forests, with the thermometer standing at 15 degrees below zero. Two days later Chevillard finished his Scandinavian tour of nearly 10,000 kiloms. by flying to the military centre at Lillistrom with Capt. Thaulow as passenger.

Flying Over French and Spanish Warships.

AFTER flying at Bazia and Lorca, Lucien Demazel, on his Blériot, taking his father as passenger, flew over to Cartagena and piloted his machine over the train in which the King of Spain and the French President were travelling. On their arrival at the station, he dropped a bouquet tied with ribbons of the French and Spanish national colours, and this was picked up by a soldier and taken to the King of Spain. Later Demazel flew over the French and Spanish fleets, and in the evening the aviators were received by the King and President on board the cruiser "Diderot."

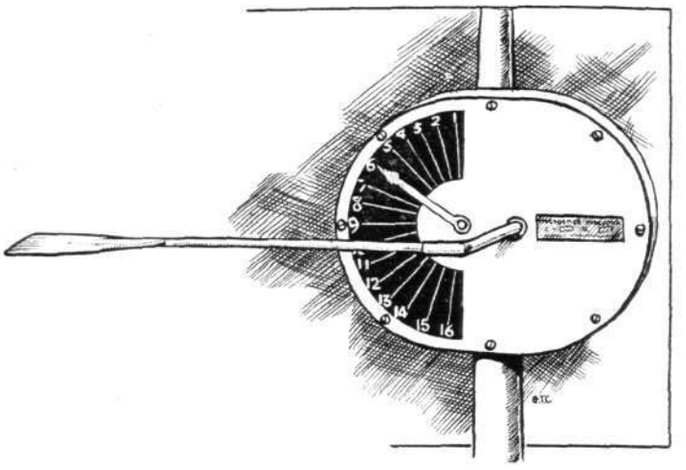
The Wilhelm Kress monument erected to the memory of the Austrian pioneer of that name, which has just been inaugurated at Unter-Tullnerbach. The work is by Rudolf Freiherr von Weigl.

THE RUSSIAN MILITARY TRIALS.

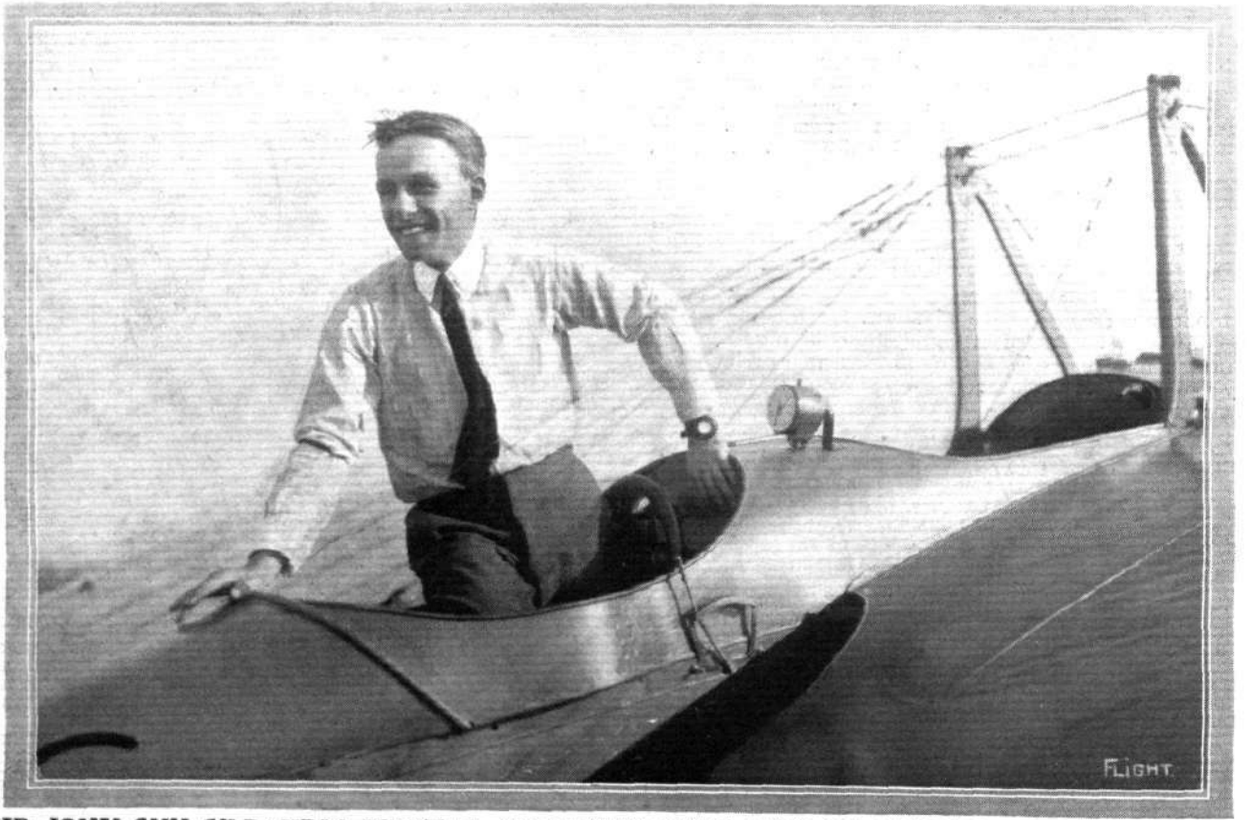
BELOW are the tabulated results of the Russian Military Aeroplane Trials as drawn up by the judges from a table furnished. Nine machines were entered for the trials, but only three completed all the tests, and one only missed making one test. These four, whose performances are detailed below, secured prizes of £1,000, £600, £400 and £200. Machines fitted with 50 h.p. engines had to carry a load of 240 kilogs. in all tests, and those having 100 h.p. engines 340 kilogs. Machines of foreign construction were handicapped 10 per cent. in the marking :—

	Sikorsky Bi.	Sikorsky Mono.	Deper-dussin.	Morane.
Motor starting by pilot	Passed	Passed	Passed 15s.	Passed 25s.
Vol plané 300m. ...	120s.	58s.	1m.	52½s.
Piqué 300m.	45s.	35s.	24s.	22s.
Climbing speed (500 m.)	5m. 20s.	6m. 15s.	3m. 6s.	3m. 15s.
Duration flight... ...	1h. 34	1h. 31½	1h. 31	1h. 35
Landing on 35 cm. grass	Passed	Passed	Passed	Passed
Get off in ,,	Passed	Passed	Passed	Passed
Landing on ploughed land	70	60	60	25–30
Get off from ploughed land	150	140	80	Passed
Shortest landing ...	59m. 19	55m.	78m.	—
,, get off under 90 metres	80,30	77	72	77,28
Speed	98,2	102,3	105,2	119,3
Get off without help ...	Passed	Passed	Passed	Passed
Maximum load carried	437 kilog.	417 kilog.	390,4	—
Minimum speed ...	67·3 km.	71·6 km.	82·5	94 km.
Time taken to—				
Half dismantle ...	12m. 31s.	9m. 30s.	20m. 54s.	7m. ½s.
Reassemble	18m. 43s.	9m. 52s.	26m. 4s.	23m.
Dismantle and put in case	10m. 47s.	14m. 20s.	14m. 15s.	16m.
Reassemble from case	11m. 24s.	11m. 18s.	24m. ½s.	16m. 20s.

A WRIGHT INCIDENCE INDICATOR.



The Wright incidence indicator is a simple wind vane controlling a pointer moving over a dial. The pointer is controlled by a special mechanical contrivance which is said to eliminate any gravity influence, but no details of the operating mechanism are available. The pointer shows the angle of the chord to the true relative wind, and so informs the pilot of the effective attitude of the machine. So long as the pilot keeps his angle approximately on the normal mark he will fly at his proper speed, and will neither descend too fast nor get stalled when trying to climb. There is no question that many accidents occur through the persistent neglect of pilots to accustom themselves to the use of such simple instruments as the speed or incidence metre and the ribbon. The weight of the Wright incidence indicator is 2¼ lbs., and the dial can be read at a distance of 10 feet.



MR. JOHN GUY GILPATRIC, PILOT No. 171 OF THE AERO CLUB OF AMERICA.—Mr. Gilpatric is the holder of the American altitude record with passenger, which he secured at Los Angeles, California, in November last. When he made this record he was only sixteen years of age, and flies one of the French-built Deperdussin monoplanes with very great effect. He holds the position of chief pilot for one of the largest aeroplane companies in America. Many of our readers will be interested to learn, and will remember, that a few years ago Mr. Gilpatric used to correspond with FLIGHT, at that time he being only a youngster in "shorts."

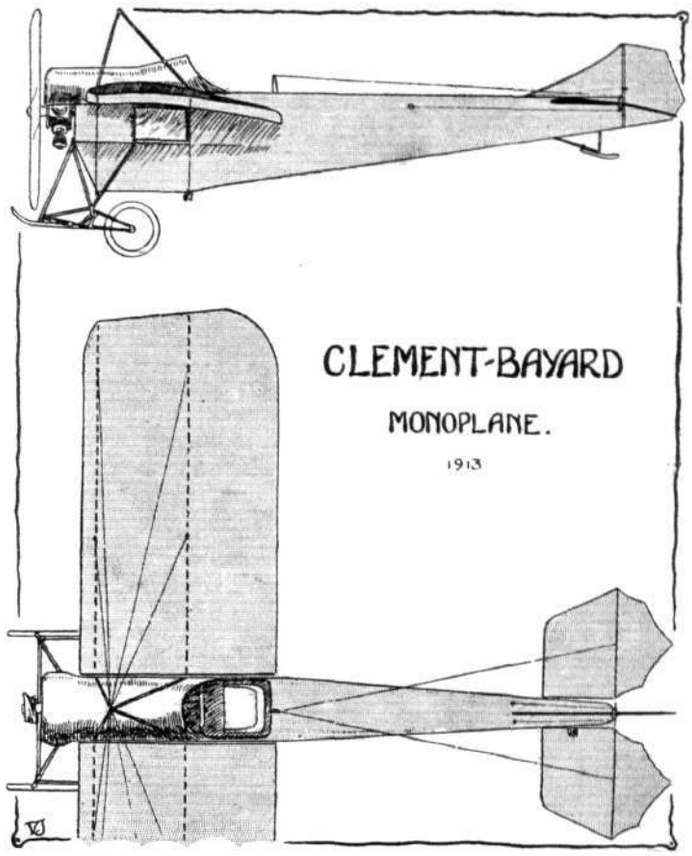
FLIGHT

AEROPLANE TYPES.

THE CLEMENT-BAYARD MONOPLANE.

GUILLAUX'S remarkable flight some little time back from Savigny to Paris, when he travelled at a speed of 144 miles per hour, naturally centres one's attention on the Clement-Bayard monoplane, which was the make of machine he flew on this occasion. The main point of interest in the Clement-Bayard monoplanes lies in their steel construction. With the exception of the wing spars and skids, nickel steel tube is employed throughout. The fore part of the *fuselage* is pentagonal in section, whilst behind the pilot's seat the *fuselage* is triangular. In front of the pilot, windows are let into the sides of the *fuselage* in order that a clear view under the wings may be obtained, The wing spars are of channel-section steel, the attachment to the *fuselage* being such that the wings can easily and quickly be removed or attached. The rear spar is situated very nearly along the centre of the wing, so that there is a large proportion of trailing edge. In this way a very effective warp is obtained which makes the machine sensitive in control. Another interesting feature with the Clement-Bayard machine is the landing chassis, which is extremely strong. It consists of a pyramid-like structure of steel tubes, the apex of which is attached to the nose of the *fuselage*, whilst the base is connected to two skids carrying at their rear ends sprung running wheels. Two steel struts also extend from the rear of the pyramid to the sides of the *fuselage*. Both single and two seater models are made, and 50 h.p, 70 h.p., or 80 h.p. Gnome engines are employed. The principal dimensions of the 70 h.p. Military single-seater are as follows:—Span 9·200 m., length 7·500 m., supporting area 16 sq. m., weight (empty) 320 kilogs., speed 120 k.p.h.

"VEE JAY."



AIRSHIP AND BALLOON NEWS.

The Wreck of the Zeppelin.

ELSEWHERE in this issue we comment upon the terrible catastrophe which befell the German Navy's new Zeppelin L2, on Friday last week, just outside the Johannisthal aerodrome, near Berlin. From the following official account it appears that the airship was making a trial voyage:—

"She started this morning for a high flight, with twenty-eight persons on board. After three minutes she had attained a height of two hundred metres (over 600 feet) when flames burst forth between the fore engine-car and the envelope. In two or three seconds the whole ship was on fire and an explosion occurred. At the same time the airship fell slowly head downwards, until she was forty metres (130 feet) from the earth. Here a second explosion took place, presumably of benzine. When the vessel struck the earth a third explosion occurred, and the framework collapsed. A company of pioneers and guide-rope men hastened to the scene, and doctors were immediately in attendance. Two of the crew were picked up outside the ship still alive, but they died shortly afterwards. Lieut. Bleuel, who was severely injured, was taken to hospital. The remaining 25 of the crew had been killed during the fall of the airship or by the impact with the earth. The cause of the disaster appears to have been, so far as is at present known, an outbreak of fire in or over the fore engine-car."

The commanding officer was Lieut. Freyer, and he was assisted by Lieuts. A. Trenck, Hansmann, and Busch, with thirteen warrant and petty officers. There were also on board as representing the German Navy, Commander Behnisch, Naval Constructors Neumann, and Pieztker, and three secretaries, named Lehmann, Priess, and Eisele. The Zeppelin Co. were represented by Capt. Glund and three mechanics, and Lieut. Baron von Bleuel was a passenger. The last mentioned was the only one rescued alive, and he died from his injuries a few hours later.

One of the first messages of sympathy was addressed by President Poincaré to the German Emperor.

Extraordinary scenes, showing the way in which the calamity was regarded in Germany, were witnessed at the funeral service of 23 of the victims, held on Tuesday at the Garrison Church. Upon each of the coffins Prince Adalbert placed a wreath from the German Emperor and Empress, who with the Crown Prince and Princess, and Princes Eitel Friedrich, Adalbert, August Wilhelm, Oscar, and Joachim attended the service in person, while the Government was represented by the Chancellor, Admiral Tirpitz, the Chief of the General Staff, Field Marshal von Moltke, and many other officers. Count Zeppelin was also present.

By Parachute from Dirigible.

AN interesting experiment was carried out on Saturday at Aldershot by Major Maitland, in command of the Airship Squadron of the Royal Flying Corps. When the airship "Delta" was at a height of 1,800 ft. he slid off the car, and dropped to the ground suspended from a parachute. The parachute opened after a drop of about 100 ft., and Major Maitland made a safe although wet "landing" in the Cove Reservoir. The tests were made under the direction of Mr. Gaudron, the maker of the parachute.

The "Eta" at Colchester.

ON Thursday of last week, the new Army airship "Eta," with Lieut. Major the Hon. Claude Brabazon in command, and with Lieut. the Hon. James Boyle and Lieut. Hetherington on board, cruised from Farnborough to Colchester, descending for the night in the park of the Benchurch Hall estate. She returned to Farnborough the following day.

"Sachsen" Returns to Johannisthal.

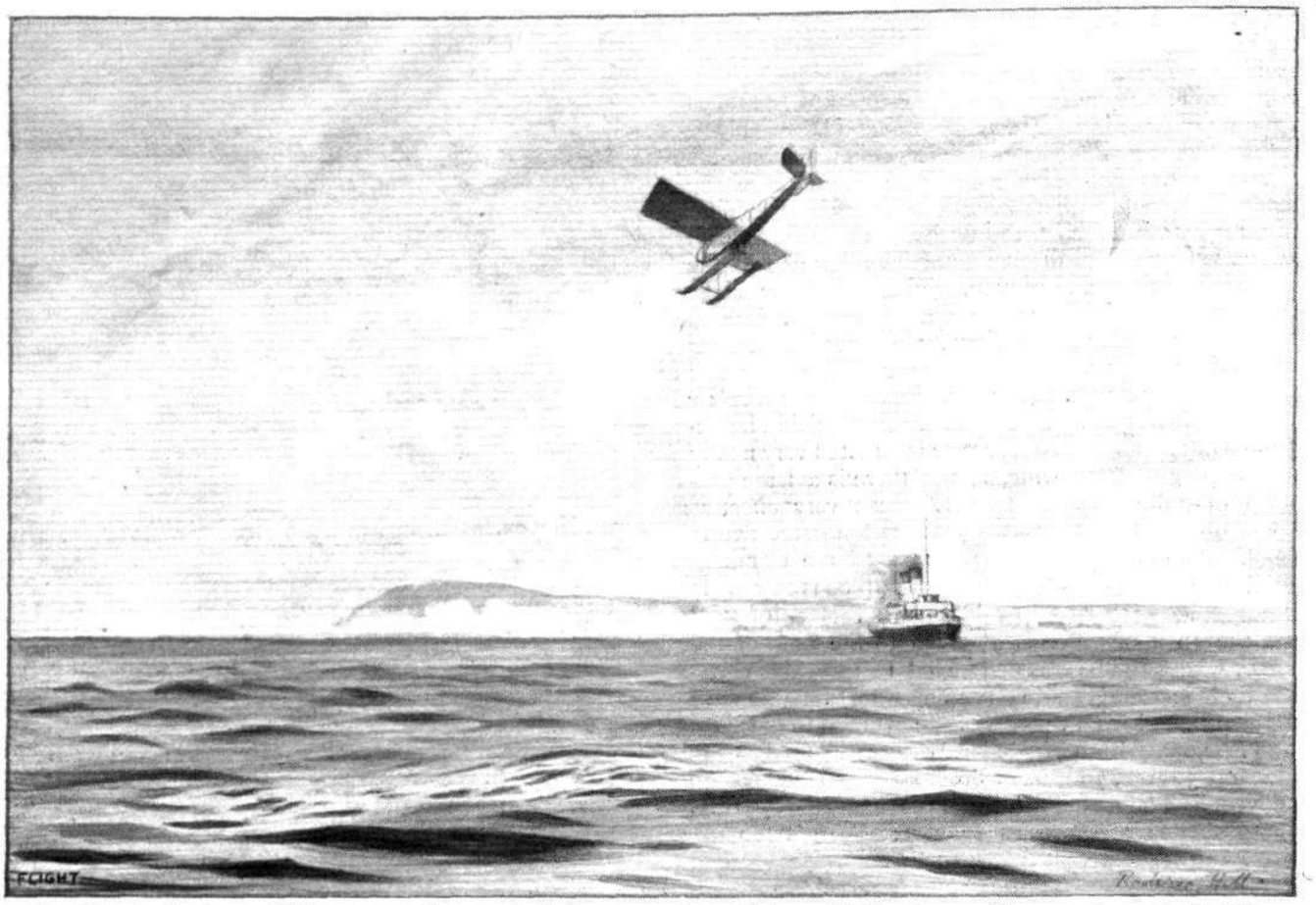
LATE in the evening of the 14th inst. the Zeppelin liner "Sachsen" started from Leipzig and arrived next morning at Johannisthal. Those on Board included the Minister of War, and several of the chief Army officers. The return trip to Leipzig was made during the afternoon of the 15th inst.

5½-Hour Cruise by "Conté."

ON the morning of the 16th inst., the Astra dirigible "Conté" was taken for a 5½-hour trip, mainly for the purpose of testing compasses. Against a strong wind she made her way from Issy to Nangis, and returned *via* Provins to Issy.

The Gordon-Bennett Balloon Race.

ALTHOUGH the result of the Gordon-Bennett balloon race has not yet been officially published, there is little doubt that the race has been won for the fourth time by the U.S.A., in fact the two American representatives were first and second. The winning American balloon, Goodyear, was the only one to cross the Channel. Of the British balloons, that piloted by Mr. de Francia was placed 11th, while Mr. Dunville's was 14th. The previous American wins were in 1906, 1909 and 1910.



Mr. Claude Grahame-White, on a Morane-Saulnier waterplane, flying off Newhaven Harbour towards Brighton during the past summer. From an original drawing by Roderic Hill.

A Farman Hydro. for Italy.

FOLLOWING its splendid performance in the Italian Lakes competition the Italian Government purchased the Henry Farman hydro-aeroplane, and it was put through the official tests before delivery on the 13th inst. In the competition the machine got off the water after a run of only eight metres, which it is claimed is a record.

Spanish Aeroplanes in Morocco.

FOLLOWING on the successful use of aeroplanes in Morocco by France, the Spanish Government has decided to station an aeroplane squadron in their Moroccan possessions. The squadron, which is under the command of Capt. Kindelan, and includes the Infante Alfonso of Orleans-Bourbon and thirteen other officers, left Madrid on Monday.

AEROPLANE DESCRIPTIONS, WITH SCALE DRAWINGS.

FOR the information of our readers, the following detailed descriptions of machines have appeared in FLIGHT. Most of these copies are still obtainable from the Publishers, 44, St. Martin's Lane, W.C., at 6½*d.* each, post free, for those published during 1911 and 1912, and for the current year (1913) the charge is 3½*d.*, post free.

Machine.	Date Published.
1911.	
Army biplane...	July 15
Avro biplane	Nov. 4
Blackburn monoplane	Aug. 5
Breguet biplane ...	July 22, July 29
Bristol Military biplane	Mar. 18
Bristol monoplane	Sept. 30
Deperdussin monoplane ...	Aug. 19
Dunne monoplane	June 24
Etrich monoplane	Nov. 11
Fritz monoplane	Aug. 12
Grahame-White Baby biplane ...	Mar. 25
Martin-Handasyde monoplane ...	Mar. 25
Morane monoplane	July 29
Nieuport 2-seater monoplane ...	Oct. 7
Paterson biplane	Dec. 2
Roe triplane	April 1
Sanders biplane	Mar. 4
Short biplane...	June 10
Short double-engine biplane ...	Sept. 9
Star monoplane	July 1
Valkyrie monoplane	April 1
Weiss monoplane	June 17

Machine.	Date Published.
1912.	
Avro Military biplane	Aug. 31
Avro monoplane	Oct. 12
Blackburn monoplane	Nov. 16
Caudron biplane	Nov. 30
Caudron racing monoplane	May 11
Cody Military biplane	Sept. 7
Cody monoplane	June 29
Coventry Ordnance biplane	May 18
Deperdussin monoplane	Feb. 10, Sept. 7
Flanders monoplane ...	Mar. 23, Dec. 21
Handley Page monoplane	Oct. 26
Henry Farman biplane	Oct. 19
Jezzi biplane	Dec. 14
Lake Flying Co.'s hydro-biplane ...	Dec. 7
Maurice Farman biplane	July 6
Morane-Saulnier monoplane ...	Feb. 3
New Avro biplane	Mar. 30
Paulhan-Tatin monoplane	Feb. 17
Short monoplane	Mar. 9
Sommer biplane (all steel)	Jan. 27
Sopwith-Wright biplane	Nov. 23
Viking I biplane	Jan. 20

Machine.	Date Published.
1913.	
Avro hydro-biplane	July 12
Blériot sand yacht	Aug. 9
Borel hydro-monoplane	July 26
Borel Military biplane	Aug. 23
Breguet biplane	June 14
Bristol monoplane	May 17
British Deperdussin hydro-monoplane	May 10
Burgess flying boat	June 28
Caudron hydro-biplane	Aug. 2
Cody waterplane	Aug. 16
Dyott monoplane	April 26
E.A.C. monoplane	May 3
Grahame-White biplane	Feb. 1
Grahame-White 5-seater biplane ...	Oct. 11
Lake Flying Co.'s waterplane ...	July 19
Martin-Handasyde monoplane ...	Jan. 4
Morane-Saulnier monoplane ...	May 24
Nieuport hydro-aeroplane	April 19
Parsons biplane	June 21
Radley-England waterplane	April 12, Aug. 16
Short biplane...	June 7
Sopwith waterplane	Aug. 16
"Tong-Mei" tractor biplane ...	May 31
Westlake monoplane	Sept. 13
Wright hydro-biplane	Sept. 6

Models

Edited by V. E. JOHNSON, M.A.

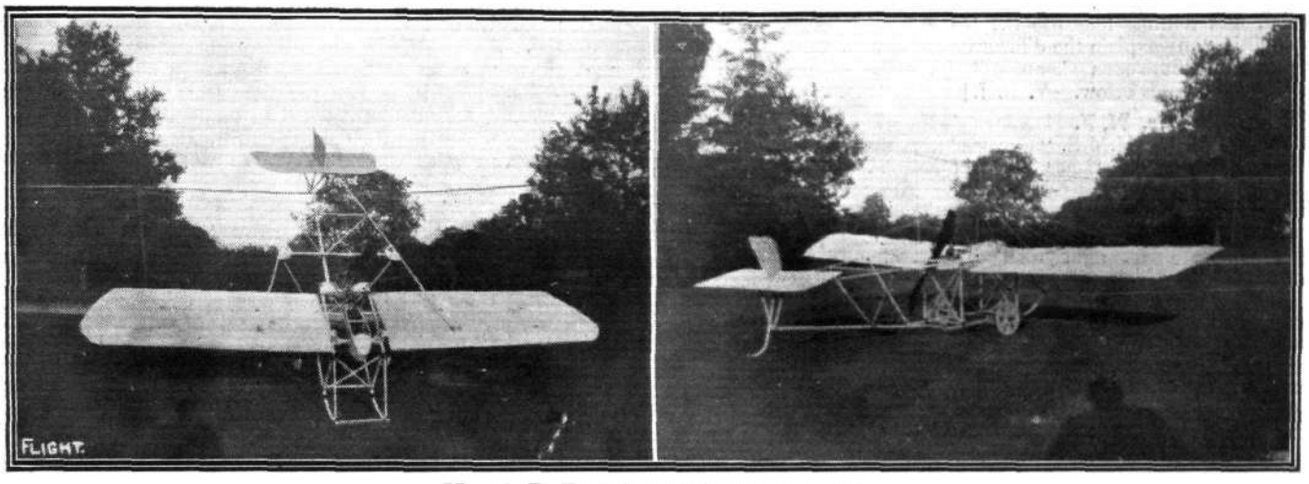
A Petrol Driven Model.

"I enclose," writes Mr. C. F. Fearn (Cuckfield, Sussex), "some photographs of a power-driven model I have just completed. I have only been able to try it for two days for about one and a half hours each time, but it has flown quite well, although the distance available is only some 300 yards. It flies very slowly, and is quite stable. The following particulars may be of interest to your readers. Span, 14 ft. 9 ins.; length, 10 ft. 6 ins.; area of wings, 31 sq. ft.; area of tail, 5½ sq. ft.; weight complete, 38 lbs.; angle of incidence, 12°; dihedral angle, 5°. The wings are double surfaced, with a fairly large camber. The main spar, which is about 5 ins. from the front edge, is 1·25 by 1·25 I section; the rear spar is of the same section, but the dimensions are 1 in. by 0·75 in. The ribs are also of the same section, but lightened out, and are one foot apart. The wings, &c., are doped with Emaillite.

"The tail plane is also double surfaced, the whole plane moving for elevation. The front *fuselage* is made chiefly of 1 in. by 0·75 in. spruce, the cross pieces being five-ply. The tail outriggers are 0·5 in. by 0·5 in. spruce, while the triangular cross pieces are 0·5 in. by 0·75 in. of streamline section. The *cabane* is made of steel tubing about $\frac{9}{32}$ in. diameter, and the axle is 0·75 in. steel tubing.

"The engine is a Bonn-Mayer and works very well; the propeller is 40 ins. in diameter and 30 ins. in pitch, and its normal speed is 1,200–1,400 r.p.m. I broke 1·5 ins. off the tip of the propeller when I was testing the engine on the bench, and an exhaust-valve of the engine was sticking, so that during the flights I obtained the engine could barely have been doing 1,000 r.p.m. All the materials have been supplied by Messrs. J. Bonn and Co.

"It was my intention to have shown the model at the *Model Engineer* Exhibition, but owing to our just changing our residence I was unable to do so, but I intend to show it at the Aero Show next year."



Mr. C. F. Fearn's petrol-driven model.

Model Ornithopters.

"With reference to your recent remarks on the science of ornithopter models," writes Mr. E. Wilson, "permit me to compliment you sincerely on your broad-minded views thereon. I was one of those who entered for the competition, but could not leave my business at the time to attend. I wonder how many students of aviation there are who thoroughly comprehend the great difficulties to be overcome in successful ornithopter flying? And how many there are in the United Kingdom who can honestly claim to have designed and flown such a model 10 ft. let alone 100. My own experience is typical probably of many, and a brief capitulation of my efforts may possibly prove instructive to others labouring at this apparent will-o-the-wisp.

"To be perfectly honest, I have lost count of the numerous models I have tested and broken in experiment or disgust. The first was of bamboo of ⅛ in. sq. section, and had an Eiffel Tower like resemblance, the wing span being 3 ft. The weight rose appallingly with each part added, with the inevitable result that the wings merely flapped up and down uselessly. This model was of the Kress type, *i.e.*, the rotary motion of the crank was transferred into a vertical motion which actuated the wings by means of suitable levers.

"No. 2 was made larger in span, the wings being in shape and contour similar to the bat, being 5 ft. from tip to tip. This was eventually abandoned as being too large—the leverage being too great, although various mechanical motions were tried. Since then I have constructed many other models, some with two wings and some with four, the latter being the more successful of the two.

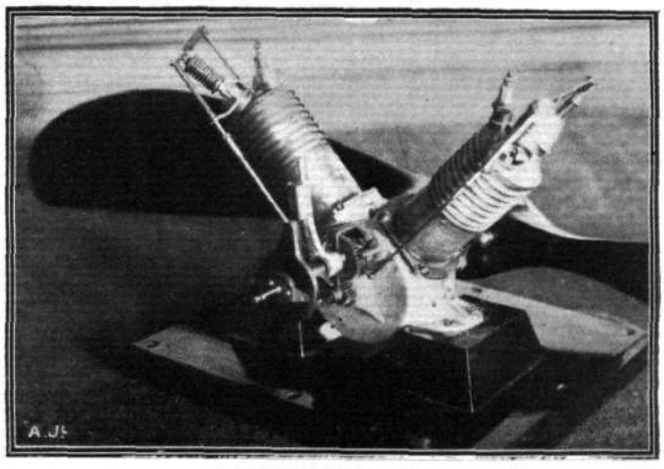
"To briefly summarise the lessons learned from these experiments, he following fundamental laws must (in my opinion) be fulfilled before successful model ornithopter flight can be accomplished:—

"(1) That the keynote and secret of success lies in properly designed and constructed wings reproducing the natural wing in all its essential requirements.

"(2) That the framework of the model must be exceedingly light yet strong, and if you can have a flying stick frame so much the better.

"(3) That the discovery of the best method of smoothly transferring the working mechanical motion of the twisted skein of rubber into a suitable wing actuating movement will occupy many months of patient labour.

"(4) That four wings work better than two, but that the weight is greater and the complications of construction increase.



The Bonn-Mayer petrol aero motor designed and constructed by Mr. F. Mayer, awarded a silver medal at the *Model Engineer* Exhibition.

"(5) That the pectoral cord certainly assists the smooth working of the two-winged type.

"(6) That the amplitude need not be excessive, which means unsymmetrical working, an arc of 60° being quite sufficient for practical purposes.

"(7) That the span be made as small as possible, any increase in the same retarding the smooth working of the wings.

"(8) That the experimentalist must be prepared to exercise the greatest patience, as model after model is sure to be broken when testing. In fact, the *science* of ornithopter model flying is a life study, and the £5 prize offered for such stringent conditions is ridiculously inadequate.

"A model ornithopter is in essence a scale working model of a full-sized machine, and very few aerodynamical scientists would care to give the fruits of their labour away for this amount. The question arises, did the promoters of this contest realise what they were asking for? I doubt it. My own original model, in reality a scale model, flies nothing like 100 ft., but I hope to shortly exhibit its capabilities, and explain the difficulties to be overcome at one of the meetings on Wimbledon Common." [A series of articles on this subject commences below.—V. E. J.]

Mr. N. F. H. Clarke's Experiment.

Mr. R. G. Hale (H.M.S. "Cyclops"), writing *re* the above, says: "The following experience which I had with one of my early models may, perhaps, be of interest. The machine was of the Canard type V frame, the wing tips of the main plane being swept back and given a pronounced negative camber. The model was a hand-launched one, weight 7 ozs. I was tuning up at the time of the occurrence, which took place at Shotly. On being launched the model began to climb, but, swerving to the right, fouled some telephone wires, with the result that it capsized. The machine then *vol planéd* upside down for about 4 or 5 yards, and then suddenly dived. I naturally expected a bad smash, but about 10 ft. from the ground the model flattened out, and again commenced to climb, finally gliding to earth. Subsequently the left wing was found to be cracked. In conclusion, please accept my thanks for the valuable assistance I have derived from the model pages of FLIGHT."

The Problem of the Ornithopter.

In considering the question of flight through the air, we have three main factors to take into consideration—(1) the necessity for support; (2) that for propulsion; (3) that of stability. The first can obviously be obtained by mere flotation, as in the case of the ordinary balloon. Or it can be derived from the mechanical reactions of the air by virtue of its inertia, as in the case of flapping birds, and the mechanically propelled aeroplane.

In the case of an aeroplane, numbers 1 and 2 are distinct; but, in the case of a bird both functions are performed by the same means. Calculations have been made to demonstrate theoretically that in the latter case, or in the case of the properly constructed wing flapping models, that such apparatus requires less work for propulsion than in the case of screw-propelled aeroplanes, *i.e.*, machines with fixed wings, because the air is attacked at a better angle and because the weight of the body in itself assists in producing the all-necessary powerful flaps of the wings.

The wing is sustained by the vertical component due to the speed and the angle of incidence, whilst in its flapping action the wing in the down stroke acts as an aeroplane gliding downwards obliquely and gains in rapidity over the relative wind owing to its *negative* angle of incidence. Whilst on the up stroke it also acts as an aeroplane lifted by the air pressure, resultant from the forward velocity produced by the down strokes, its angle of incidence now being *positive*, both actions in the case of the bird being rendered effective by the *weight of its body*. It must, however, not be forgotten that this flapping motion is not performed at any point fixed in space, but in a yielding medium. We must also allow for considerable losses due to friction, body resistance and for possible loss of altitude or height on the up stroke from the sinking of the body in the yielding air. It would appear, however, that this sinking or falling need not take place if the wing on the up stroke has an adequate positive angle of attack, whereby by means of the increased lift produced the lost height is either regained or it may even be increased.

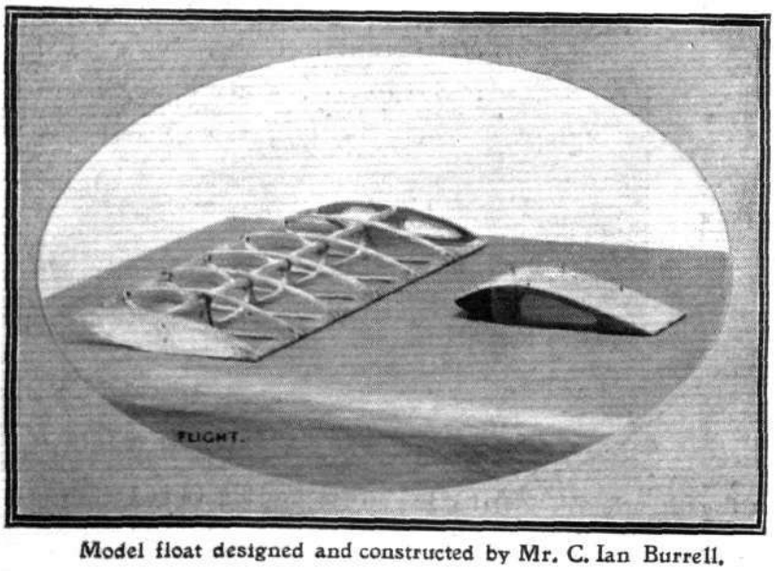
In the calculations referred to above, it has been usual to assume that on the down stroke there is no "drift," because the wing presents only its edge to the relative wind by reason of its negative angle; and also that the skin coefficient is so small that it may be neglected. Assuming (for the sake of argument) such to be the case, then—in order to fly with "flapping wings"—the "drift" must be encountered but half the time (this, of course, supposes the up and down stroke to be equal in duration, which, as a matter of fact, they are not). If D be the drift, R the body resistance, V the velocity of the machine, W the work required, we have

$$W = \left(\frac{D}{2} + R\right)V.$$

It is, however, obvious that a *constant* small angle of incidence cannot be maintained; even soaring birds cannot do it, since they must encounter various eddies and wind gusts, varying wind velocities causing them to change their course, rise, &c., &c., many of which necessitate an increase in the angle of incidence, and therefore of "drift" resistance. Due allowance must also be made for framework resistance. Again, in order to sustain the weight during the down stroke, to propel the machine, and also to store up part of the energy as has been more than once suggested in a spring or compressed air cylinder during the up stroke—to assist in the succeeding down stroke—the down stroke must produce an increased pressure and the power to do this must be taken into account: in other words, the wing cannot descend effectively at a negative angle and so evade the "drift" during the down stroke. Pettigrew ("Aerial Locomotion," p. 111) says: "In the aerial machines so far as yet devised, there is no sympathy between the weight to be elevated and the lifting power, whilst in natural flight the wings and the weight of the flying creature act in concert and reciprocate, the wings elevating the body one instant and the body by its fall elevating the wings the next." Further on, he says: "Weight assisted by elastic ligaments or springs, which recover all wings in flexion, is to be regarded as the mechanical expedient resorted to by nature in supplementing the efforts of all flying things." It would thus appear, provided the above conclusions are true, that the muscles in case of birds can be imitated more or less accurately by using some form of "spring" in their place.

If we hang a weight on a spiral spring the latter is stretched, if we pull at the weight and let it go—the spring with its weight will oscillate up and down so many times a minute. Assuming that this is a mechanical reproduction of what really happens in the case of birds—remembering, however, that in the latter case the load or pressure is added at each stroke for a continuous action—the question which arises is this: Is it an essential feature of any successful form of ornithopter model that something in the nature of springs must be employed; bearing in mind that the wing (natural or artificial) is, in the first case, and should be, in the second, both resilient and elastic; and that the medium air is itself highly elastic? Springs necessitate extra weight, and are not set in motion without the expenditure of energy. Action and reaction are always equal and opposite. Nevertheless, basing our statement on the result of practical experiments, it would appear that such are an essential feature of successful ornithopter flight.

(*To be continued.*)



Model float designed and constructed by Mr. C. Ian Burrell.

Answers to Correspondents.

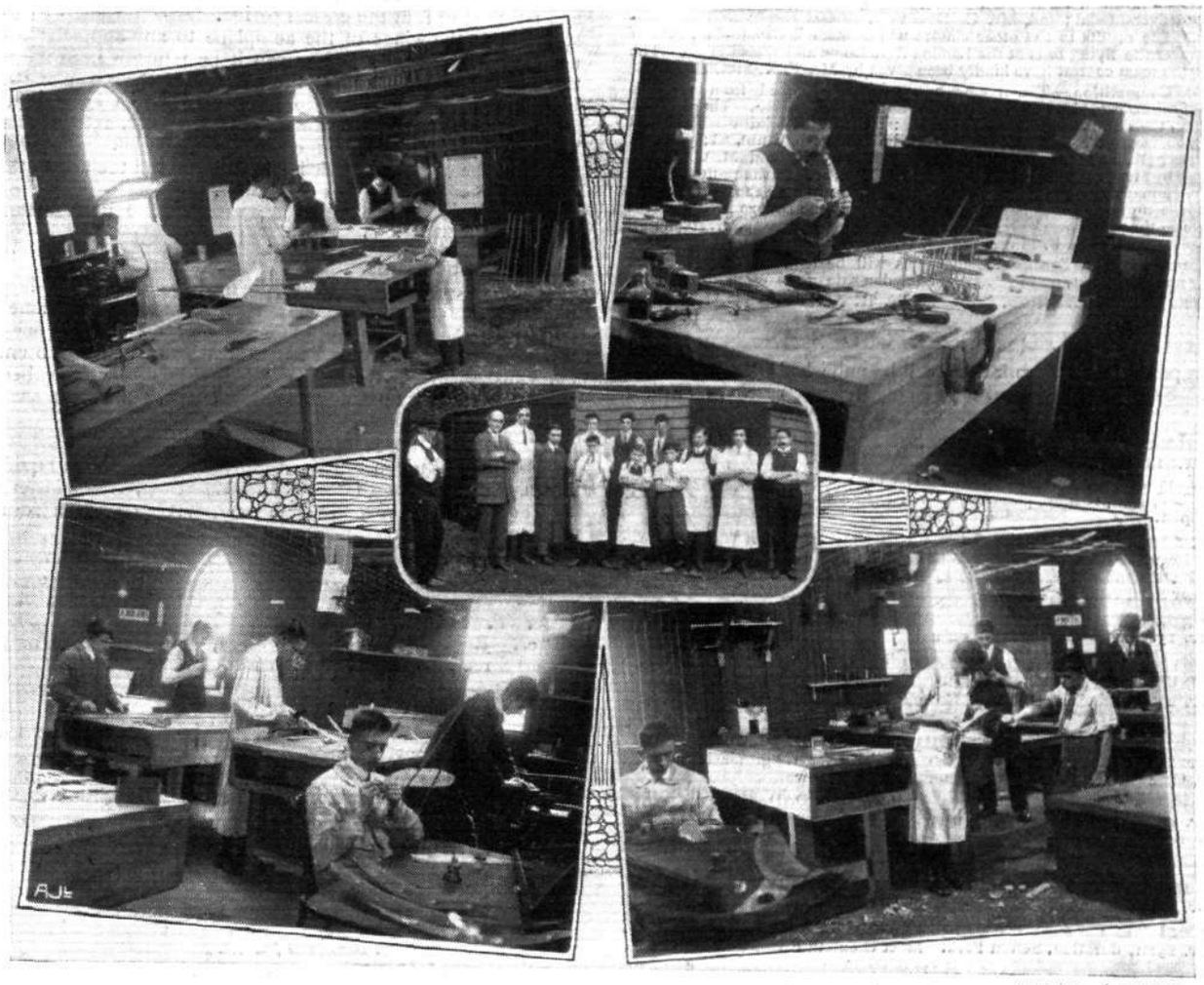
D. MCKAY.—The silk is usually glued. If the varnish has no slackening effect on the fabric, it would be advantageous to varnish it *after* it was glued on—so much depends on the varnish. Try both plans on a small plane and compare results. Whatever dope or proofing is used, it should have a tightening effect on the fabric, and not the reverse; save for floats we have not found varnish very satisfactory—why not use a light soft-proofed silk, such as the Bragg-Smith? Your other query does not fall within the scope of this section.

FLIGHT

A MODEL AEROPLANE FACTORY.

AN invitation from Messrs. Mann and Grimmer, Ltd., to visit their factory at Arlington Road, Surbiton, Surrey, was readily accepted the other day, as I thought, apart from its own interest, there was promise of some very instructive comparison with the methods and practice employed in works devoted to the turning out of full-sized machines. As, of course, is common knowledge, Messrs. Mann and Grimmer, following the success of their experimental models, have developed them commercially, and for this purpose have organised a factory at the above address, in which all the processes are carried out in a very careful and thorough way. Looking at one of the finished models it hardly seemed possible that such a simple *appareil* of wire, wood, and silk passed through so many processes and "departments" as it does. Accuracy is an all-important feature, a standard accuracy of $\frac{1}{64}$th of an inch being employed throughout, and the works are equipped with a number of ingenious jigs and position on the *fuselage*, the latter is laid on a gauge which marks the exact position.

Perhaps the most important item that makes for the success of the Mann monoplane is the propeller, which is of Mr. Mann's own design, and its construction is the most difficult job of the whole model. It is first cut to shape from thin birch planks by means of a fret machine, and then smoothed down on carborundum wheels. When smooth, the wire spindle is affixed, and the wood steamed prior to placing in a specially-designed clamp-mould. This, containing the propeller, is placed in a regulated furnace, thoroughly drying the propeller, which is then impregnated with varnish. It is thus rendered proof against damp, and the blades retain their shape indefinitely. A similar process is carried out in the construction of the elevators, in which two thicknesses of birch are employed. So far, only the important stages of construction have been mentioned, many other jobs having to be completed before the finished model is turned out to be tested by Mr. Mann himself. With all this care and exactness, it is not surprising that nearly every model flies, and flies well, at the first time of asking.



"Flight" Copyright.

THE MANN AND GRIMMER MODEL AEROPLANE WORKS.—1. Erecting machines and building *fuselage*. 2. Scale model department; a Henry Farman in the making. 3. Constructing the planes, and covering the same with fabric. 4. Shaping the propellers. In the centre a view of the staff.

formers whereby each part is, so to speak, automatically turned out to a wonderful degree of exactness. The planes, for instance, which are made of a special highly tempered steel wire—not ordinary piano wire—pass through several stages; the outer frame is first made (in halves) to shape in a former. These halves are then put into another former and joined into one, producing the outer frame of correct shape.

The frame is next placed into another former in which the ribs are attached and given their correct curvature. The *fuselage* is made of a very good quality Canadian silver spruce, carefully selected, and each member of the *fuselage* is not only exact in size, but it is also weighed so that all are of the same weight to within a few grains. They, also, are built up in a series of jigs, thereby ensuring that all are alike. A special glue is employed in joining the members of the *fuselage*, and the latter, when put together and wire braced, has the planes attached, after which it is sized and varnished. In order that the planes may be fixed in the correct

In addition to these flying models, a new department has recently been started, for the construction of scale models of any full-sized aeroplane. One of these models, an 80 h.p. Henry Farman, was being constructed on the occasion of my visit, and I was favourably impressed by the fine workmanship and accuracy of detail displayed. This model can be seen in two of the views in the accompanying illustration. There should be a good demand for such models from those who are seeking to educate the public, either through displays in museums or by special exhibitions of models. I also hear that Messrs. Mann and Grimmer are also tackling the question of power-driven models, and have also under consideration the question of building a full-sized machine.

"VEE JAY."

KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.

Twin screw, hand-launched	Distance	R. Lucas	...	590 yards.
	Duration	A. F. Houlberg	...	129 secs.
Single screw, do.	Duration	H. Bedford	...	49 secs.
Twin screw, rise off ground	Distance	L. H. Slatter	...	365 yards.
	Duration	J. E. Louch	...	2 mins. 49 secs.
Single-tractor screw, hand-launched	Distance	C. C. Dutton	...	266 yards.
	Duration	J. E. Louch	...	68 secs.
Do., off-ground	Distance	C. C. Dutton	...	190 yards.
	Duration	J. E. Louch	...	45 secs.
Single screw hydro., off-water	Duration	L. H. Slatter	...	35 secs.
Single-tractor, do., do. ...	Duration	C. C. Dutton	...	29 secs.
Twin screw, do., do. ...	Duration	L. H. Slatter	...	45 secs.

Competitions.—On Oct. 15th the judges announced their awards in Classes 3 and 5 of the Aeronautical Section of the *Model Engineer* Exhibition. Class 3, scale models: 1st, Mr. C. Desoutter, *Model Engineer* Silver Medal; 2nd, Mr. E. Nicholls, *Model Engineer* First Class Diploma; 3rd, Mr. C. J. Lane, Second Class Diploma. Class 5, aero motors: 1st, Mr. F. Mayer, *Model Engineer* Silver Medal; 2nd, Mr. C. Desoutter, *Model Engineer* First Class Diploma. The results in the other classes will be made known to-day, 25th, if possible, after the flying tests at the London Aerodrome and Welsh Harp. The prizes for the team contest have kindly been given by Mr. F. K. McClean.

Tractor Competition.—The tractor competition postponed from 11th on account of rain was held on Oct. 18th, on Wimbledon Common. There was a good entry, the results of the first five being: 1st, Mr. F. Whitworth (K. and M.A.A.), 80 marks; 2nd, Mr. D. Laing (Wimbledon Ae. Club), 68; 3rd, Mr. F. Jannaway (K. and M.A.A.) and, 4th, Mr. D. Pavely (K. and M.A.A.), tied with 53; 5th, Mr. J. E. Louch (Leytonstone Ae. Club), 40. In the re-fly for third place Mr. Jannaway beat Mr. Pavely. Mr. Whitworth won the trophy, Mr. D. Laing the antimony rose bowl, and Mr. Jannaway the Bronze Medal of the Association—the prizes being presented to the winners by Mrs. W. H. Akehurst. The judges were Messrs. F. Mayer and W. H. Akehurst.

Kite Competitions.—The kite competitions will be held at Wimbledon on Saturday next, Nov. 1st, on the Plain, Wimbledon side of the Windmill.

27, Victory Road, Wimbledon. W. H. AKEHURST, Hon. Sec.

AFFILIATED MODEL CLUBS DIARY.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Aero-Models Assoc. (N. Branch) (25, CHURCH CRESCENT, MUSWELL HILL, N.).
OCT. 25TH, 10 a.m. M.E.E. flying test at Hendon, 3 p.m. practice for Enfield Cup; 26th, 10 a.m., practice; Nov. 1st, Enfield Challenge Cup Competition, 3 p.m.

Leytonstone and District Aero Club (64, LEYSPRING ROAD).
OCT. 25TH, at 10 a.m., flying tests in connection with *Model Engineer* Exhibition at London Aerodrome. Oct. 26th, at 10 a.m., flying on Wanstead Flats, near Sand Hills.

Paddington and Districts (77, SWINDERBY ROAD, WEMBLEY).
OCT. 25TH, flying at Sudbury as usual.

Reigate, Redhill and District (THE COTTAGE, WOODLANDS AVENUE, REDHILL).
OCT. 25TH, flying on Earlswood Common 4 p.m. Lecture at headquarters 8 p.m.

Sheffield Aero Club (35, PENRHYN ROAD, SHEFFIELD).
ENTRIES for "The Colver Cup" competition for r.o.g. machines close Sunday, Oct. 26th, 8 p.m., when the numbers will be drawn.

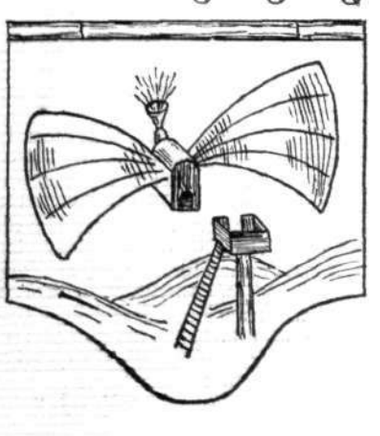
Wimbledon and District (165, HOLLAND ROAD, W.).
OCT. 25TH AND 26TH, flying as usual.

UNAFFILIATED CLUBS.

Edinburgh Ae.Soc. (Model Section) (41, DRUMSHEUGH GARDENS)
NOV. 1ST, duration contest, Lauriston Farm, Davidson's Mains, 2.30 p.m.

Liverpool Aero Research Club (62, CEDAR GROVE, LIVERPOOL).
OCT. 25TH, duration, Sefton Park. Meet Croxteth Road, 3.30 p m.

S. Eastern Model Ae.C. (1, RAILWAY APPROACH, BROCKLEY).
OCT. 25TH, Woolwich Common, 3.30 p.m. to dusk; 26th, Blackheath, 7.30 to 10 a.m. Lee Aerodrome, 10.30 a.m. to 12.30 p.m.



Modern Prophecy.—Lieut. J. W. Dunne sends us the accompanying very interesting tracing off an old brass snuff box dated when the steam engine was first used in England. This has reached Lieut. Dunne from Mrs. Billings, of Kilner Park, Ulverstone, in whose possession the original snuff box is.

CORRESPONDENCE.

Bending or Distortion.

[1802] Has any correspondent in this "problem" noticed that the inside wing shows the bending, in the outside wing as near as can be seen there is none?

Now if it was a case of bending under head resistance, would not the outside wing be the bent one owing to the fact that that wing is moving considerably faster than the inside in rounding the pylon and therefore should receive more resistance?

Waltham Abbey. P. MOSS.

The Theory of the Dunne Aeroplane.

[1803] May I add a few words to my letter on this subject which appeared in last week's FLIGHT.

It seems equally impossible for this "reserve tangential" effect to occur temporarily. This would imply that in some manner energy which had already been expended by the aeroplane was stored up and returned to it at the critical period. Now the energy cannot be stored up in the wings of the aeroplane to any appreciable extent, as they are almost rigid. Nor can it be returned from the air; for the disturbance produced by the passage of the aeroplane extends but a very short distance in front of it, say a foot or two at most. This would be traversed in about $\frac{1}{60}$ of a second, and in that short time no appreciable result could be produced. Practically the whole of the energy expended is left behind in the air to the rear, where the aeroplane cannot draw on it.

J. H. HUME-ROTHERY.

A Change of Name.

MESSRS. BOUGIE, POGNON, LTD., have decided to shorten the name of the Hobson Pognon plug to Hobson plug, a name which will trip off the tongue much more easily than the old one. Also the name of the firm has been changed to H. M. Hobson, Ltd., 29, Vauxhall Bridge Road, S.W., but it should be remembered that the changes are of nomenclature only, the plug and the management remaining as heretofore.

A Change of Address.

THE British Deperdussin Aeroplane Co., Ltd. (in liquidation), has removed its offices from 39, Victoria Street, Westminster, S.W., to Clun House, Surrey Street, Strand, W.C., to which address all communications should now be sent.

NEW COMPANY REGISTERED.

A. T. Hydroplane Synd., Ltd.—Capital £100, in 1s. shares. Registered by W. T. Hick, Broad Street House, New Broad Street, E.C.

Aeronautical Patents Published.

Applied for in 1912.

Published October 9th, 1913.

18,829. SIEMENS SCHUCKERTWERKE GES. Sustaining balloons for airships.
20,815. J. H. HALL. Means of destroying airships, aeroplanes, &c.
21,536. G. H. CURTISS. Aerial machines.
21,943. G. DONATI. Aeroplanes.
28,682. A. T. ZEISE. Flying machines.

Published October 16th, 1913.

21,631. A. PLACEK. Aerial machines.
21,657. H. A. GREGORY AND J. W. HOWLETT. Wings, &c., of aeroplanes.

Applied for in 1913.

Published October 9th, 1913.

4,301. C. AND J. MENDIZABAL. Aeroplanes.
6,946. S. DRZEWIECKI. Aerial machines.
8,332. G. KINDERMANN. Aeroplane with parachutes.

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